Vol. 935 Number 1

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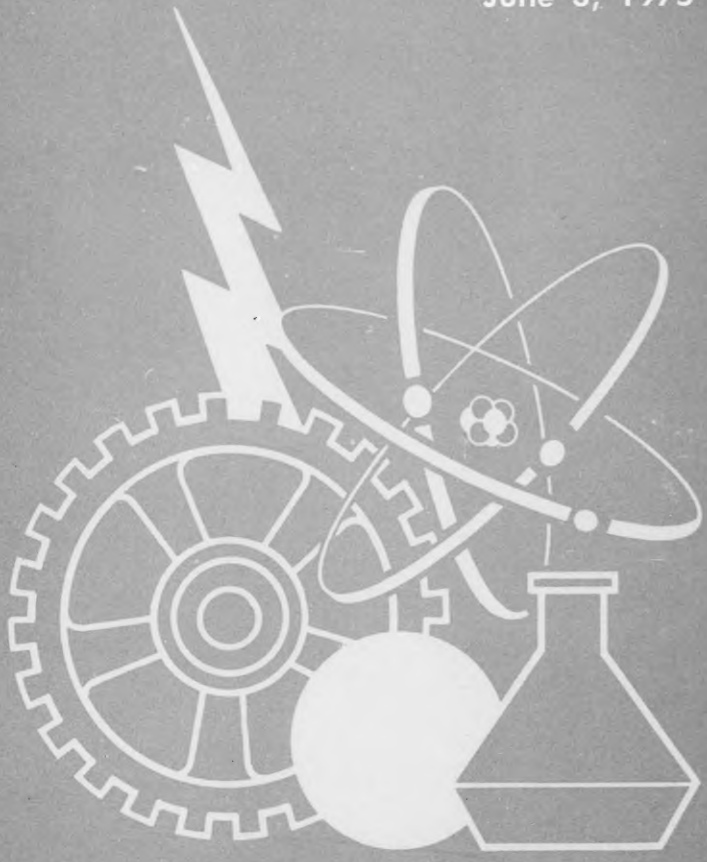
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

June 3, 1975



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OFFICIAL GAZETTE (PATENTS SECTION) - SUBSCRIPTION SURVEY

Repeated increases in printing and postal costs have raised the subscription price of the Official Gazette (Patents Section) to $342.20. In an effort to reduce subscription costs, the Commissioner, U.S. Patent and Trademark Office, and the Superintendent of Documents, U.S. Government Printing Office, desire input from subscribers as to several possible alternatives. Your cooperation in completing this questionnaire is requested.

A separate questionnaire should be completed for each subscription, using this form. Replies on photocopies of this form are welcome, but will be considered as coming from non-subscribers.

Please check one of the following which best represents your relationship, as respondent.

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POSSIBLE ALTERNATIVES

1. In addition to the present form of the Official Gazette (Patents Section), the Official Gazette might be made available in microfiche form, i.e., a sheet of film containing multiple images arranged in a grid pattern according to the American National Standard microfiche, measuring 4 x 6 inches (105 x 148 mm.) with a grid pattern of 7 rows and 14 columns, presenting a total of 98 pages of matter in micro-images at a reduction ratio of 24:1. The weekly Official Gazette (Patents Section)

could be produced on five microfiche. Each microfiche would contain: a heading with such information as the title, volume, issue number and date; and the range of the patent numbers in the issue. This heading would be of sufficient size to be read without magnification. Estimated cost is $140 per year. Readers to accommodate this type of microfiche are available commercially at a price of $75 to $250.

If such a microfiche option were available as an alternative to the Official Gazette (Patents Section), I would subscribe to it. YES _____ NO _____. How many copies? _____. If answer is yes, I would _____ would not _____ retain my subscription to the Gazette in paper form.

2. The Official Gazette could revert to publishing patent abstracts instead of patent claims. Savings would occur because the patent abstracts are shorter in length than the patent claims.

	APPROXIMATE ANNUAL SAVINGS PER SUBSCRIPTION	I FAVOR SUBSTITUTION OF ABSTRACTS YES	NO
a. Mechanical Section	$24	___	___
b. Electrical Section	16	___	___
c. Chemical Section	7	___	___
d. Entire Official Gazette	47	___	___

3. There might be provided a choice of receiving the Gazette by either the present first class mail or fourth class mail. Fourth class would be about $77 cheaper than first class, but would normally be slower (up to five days).

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QUESTIONNAIRE SHOULD BE RETURNED BY July 7, 1975 TO ENSURE CONSIDERATION.

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

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THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $342.20 per annum, foreign mailing $85.55 additional; single copies $6.60 each.

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Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,807,213, S. Rosen, FILLING MACHINES; **2,907,614,** same, PRECISION PUMP; **3,237,661,** same CONTAINER FILLING SYSTEM, **filed** Nov. 10, 1971, D.C.N.J. (Newark), Doc. C–1663–71, *Sidney Rosen and National Instrument Co., Inc.* v. *Harry G. Kalish and H. G. Kalish Co., Ltd.* Stipulation and order of dismissal of action, Nov. 19, 1974.

2,864,990, A. D. Hill, AUTOMATIC PILOT; **2,973,413,** same, COMPASS SUSPENSION FOR AUTOMATIC PILOT; **3,018,-750,** same, MERCURY SWITCH CONTROL FOR ELECTRICALLY GOVERNED RUBBER, **filed** Apr. 2, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV–74–869–JWC, *Ann M. Hill* v. *Robert Baltierra.* Filed plaintiff's request for dismissal of complaint with prejudice to plaintiff and the consent of defendant and order thereon, entered Nov. 26, 1974.

2,907,614. (See 2,807,213.)

2,909,384, M. F. Saxton, MAGNETIC DOOR CATCH, **filed** Jan. 10, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c99, *Engineered Products Company* v. *Richard K. Sweet and Assoc.*

2,916,546, Ginsburg and Dolby, VISUAL IMAGE RECORDING AND REPRODUCING SYSTEM AND METHOD; **2,916,-547,** Ginsburg and Henderson, Jr., RECORDING AND REPRODUCING SYSTEM; **2,968,692,** Ginsburg and Dolby, ELECTRONIC SWITCHING SYSTEM FOR MAGNETIC RECORDER AND/OR REPRODUCER; **2,996,576,** R. M. Dolby, VIDEO SYSTEM WITH TRANSIENT AND DROPOUT COMPENSATION; **3,003,025,** Ginsburg, Henderson, Jr., Dolby and Anderson, VIDEO RECORDER TAPE AND HEAD SPEED CONTROL SYSTEM; **3,017,462,** Clark and MacLeod, TAPE APPARATUS SYNCHRONIZING SYSTEM; **3,100,816,** Coleman, Jr. and Jensen, TIMING CONTROL FOR SIGNAL REPRODUCING SYSTEM; **3,340,367,** Coleman, Jr., Felix, Jensen, PLAYBACK EQUALIZATION SCHEME FOR A REPRODUCED FREQUENCY MODULATED SIGNAL; **3,345,457,** D. B. MacLeod, TENSION CONTROL FOR WIDEBAND RECORDING SYSTEM; **3,519,761,** A. J. Trost, RECORD EXCITATION OPTIMIZATION METHOD AND APPARATUS FOR ROTARY HEAD MAGNETIC TAPE RECORDERS, **filed** Jan. 7, 1975, D.C., N.D. Calif. (San Francisco), Doc. C–75–35–ACW, *Ampex Corp.* v. *International Video Corporation.*

3,047,040, T. A. O. Gross, PNEUMATIC LOAD BEARING DEVICES, **filed** Apr. 3, 1969, D.C. Mass. (Boston), Doc. C.A. 69–334–J, *Thomas A. O. Gross* v. *General Motors Corporation.* Judgment for the defendant declaring (*a*) that Claims 1, 2 and 4 are not infringed, (*b*) that Claims 1, 2 and 4 are invalid. Plaintiff is permanently enjoined from asserting any further claim of infringement and from bringing any further suit based uuon Claims 1, 2 and 4 against the defendant, Jan. 14, 1975.

2,916,547. (See 2,916,546.)

2,968,692. (See 2,916,546.)

2,973,413. (See 2,864,990.)

2,996,576. (See 2,916,546.)

3,003,025. (See 2,916,546.)

3,017,462. (See 2,916,546.)

3,018,750. (See 2,864,990.)

3,100,816. (See 2,916,546).

3,213,192. (See 2,916,546.)

3,237,661. (See 2,807,213.)

3,244,359, C. A. Holland, CRATE SUPPORTING AND DOOR OPERATING STRUCTURE, **filed** Dec. 4, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV 74–3556–RF, *Clarence A. Holland* v. *Jack DeWolf.*

3,340,367. (See 2,916,546.)

3,345,457. (See 2,916,546.)

3,375,679, W. F. Helsel, REFRIGERATOR-FREEZER CONSTRUCTION, **filed** Dec. 26, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c3742, *Fedders Corporation* v. *Amana Refrigeration, Inc.* **Same, filed** Nov. 8, 1974, D.C. Iowa (Cedar Rapids), Doc. C–74–58, *Amana Refrigeration, Inc.* v. *Fedders Corporation.*

3,428,333, V. E. Nelson, TOW-TYPE SECTIONAL AUTOMATICALLY FOLDABLE HARROW CART, **filed** Jan. 21, 1975, D.C. Minn. (St. Paul), Doc. C–6–75–21, *Gladys Nelson Howen* v. *Clark Equipment Co.*

3,432,867, G. R. Whitten, Jr., GUTTER AND WATER SUPPLY SYSTEM FOR SWIMMING POOLS; **3,537,111,** same, SYSTEM FOR CONTROLLING WATER LEVEL AND RECIRCULATION IN SWIMMING POOLS WITH GUTTERS, **filed** Oct. 7, 1974, D.C.N.J. (Newark), Doc. 74–1546, *George R. Whitten, Jr.* v. *KDI Sylvan Pools, Inc. et al.*

3,458,783, M. A. Rosenberg, HERMETICALLY SEALED CAPACITOR, **filed** Jan. 16, 1975, D.C., C.D. Calif. (Los Angeles), Doc. 75–154 WPG, *San Fernando Electric Mfg. Co.* v. *Varadyne Industries, Inc.*

3,469,686, Gutsche, Harris and Walsh, RETAINING TRAYS FOR SEMICONDUCTOR WAFERS AND THE LIKE; **3,482,-682,** P. W. CRONKHITE, same, **filed** Sept. 25,1974, D.C., N.D. Calif. (San Francisco), Doc. C–74–2043–SW, *Semicon Systems Inc.* v. *Galamar Industries, Inc.*

3,482,682. (See 3,469,686.)

3,519,761. (See 2,916,546.)

3,537,111. (See 3,432,867.)

3,547,057, S. R. Wilson, UNDERGROUND INCINERATOR, **filed** Nov. 25, 1974, D.C., N.D. Tex. (Lubbock), Doc. CA–5–74–126, *Stanley R. Wilson* v. *D. L. Roberson, doing business as Roberson Bros. Cesspool Drilling Co.*

3,558,381, W. D. Colianni, METHOD OF MAKING BUTTONHOLES, **filed** Oct. 9, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c2906, *William D. Colianni* v. *The Krece Corporation.*

3,739,653, D. Bogosh, SPEEDOMETER DRIVES, **filed** May 29, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c1467, *Donald Bogosh* v. *Stewart-Warner Corporation.*

3,742,571, R. C. Brehm, APPARATUS FOR TRIMMING AND INSERTING WIRES; **3,766,622,** Brehm, Long and Over, AUTOMATIC APPARATUS FOR ATTACHING WIRES TO TERMINALS, **filed** Oct. 31, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c3147, *AMP Incorporated* v. *TRW INC.*

3,758,051, D. D. Williams, VELOCITY CONTROL AND ORIENTATION OF SPIN-STABILIZED BODY; **Re. 26,887,** W. B. McLean, PROPORTIONAL NAVIGATION SYSTEM FOR A SPINNING BODY IN FREE SPACE, **filed** Dec. 5, 1974, D.C., M.D. Fla. (Orlando), Doc. 74–366–Orl–C–R, *Hughes Aircraft Company and William B. McLean and Walter G. Finch* v. *Messerschmitt-Boelkow-Blohm, GmbH.*

3,766,622. (See 3,742,571.)

3,837,124, Johnson and O'Rourke, METHOD FOR MAKING REPLICA CONTOUR BLOCK MASTERS FOR PRODUCING SCHMIDT CORRECTOR PLATES; **3,837,125,** T. J. Johnson, METHOD AND SYSTEM FOR MAKING SCHMIDT CORRECTOR LENSES, **filed** Nov. 19, 1974, D.C. Conn. (New Haven), Doc. N–74–276, *Celestron Pacific* v. *The Criterion Manufacturing Co., Inc.*

3,837,125. (See 3,837,124.)

3,861,989, Ashenfarb, Weinblatt and Glowzenski, METHOD OF MAKING MIRRORS HAVING RANDOMLY REFLECTIVE DECORATION, **filed** Jan. 23, 1975, D.C.N.J. (Newark), Doc. 75–118, *Hoyne Industries, Inc.* v. *New Age Mirror and Tile Industries, Inc.*

Re. 26,887. (See 3,758,051.)

D. 230,099, E. R. Orr, WATER PIPE, **filed** Nov. 21, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV–74–3432–Rf, *Cabin Crafts, Inc.* v. *Berney Karp.*

Interference Practice

Listing of Attorneys or Agents in Final Decisions

A recent inquiry was made at the Board of Patent Interferences relating to the listing of attorneys' names in the heading of the final decisions of the Board of Patent Interferences.

Since this is a matter that may be of interest to those who prosecute interferences in the United States Patent and Trademark Office, the present practice of the Board of Patent Interferences is set forth below.

The heading of final decisions of the Board of Patent Interferences separately lists the names of all attorneys, agents or firms recognized as representing a party in the interference. Since firms have not been recognized by the Office since July 2, 1971, the listing of firm names is limited to firms of record in applications filed prior to July 2, 1971, and in unexecuted continuations or divisions thereof (Rule 60).

The names of the attorneys, agents or firms are taken from the interference file wrapper. The noted file wrapper lists the attorney or agent or firm of record in the applications or patent involved in the interference. Additionally, the name of any attorney presenting a party's oral argument at the final hearing is separately listed.

If a party desires to correct a firm name or exclude an attorney or agent previously of record from the above-noted decision, steps should be taken *promptly* to correct the files involved in the interference. This should be done by proceeding pursuant to the provisions of Rule 36, or by taking such other action as the party deems appropriate.

WALTER A. MODANCE,
May 6, 1975. *Chairman, Board of Patent Interferences.*

An "Open Letter" to Subscribers to the Official Gazette of the United States Patent and Trademark Office

Dear Subscriber:

The Patent and Trademark Office views the increase in the annual subscription rate for the OFFICIAL GAZETTE (Patents) from $211 to $342.20 and for the OFFICIAL GAZETTE (Trademarks) from $60.25 to $88.40, announced this past November, with the same deep concern as the many subscribers who have written to us about it.

In attempting to understand the basis for this substantial price increase, dramatic even for a period marked by inflationary spiral, we have conferred with the Public Printer of the United States and the Superintendent of Documents. Finding that publications are priced according to requirement of law that the cost of printing sales copies be recovered in the sale or subscription price, and that future price increases due to production costs and postal rate increases are in the offing, our mutual attention has been directed to steps which might be taken to reduce publication and distribution costs, or to bring the OFFICIAL GAZETTE to the public in new forms, but with the same information, at lower cost.

We have looked into possible economies in publication that might be realized through the following measures: change in size of the publication, so as to achieve a greater amount of printing for the press time involved; using a lower grade of paper, such as newsprint; changing the format of the GAZETTE, such as a three-column layout, instead of two columns; separating textual matter from drawing reproductions, placing the latter in a separate portion of the publication devoted exclusively to that matter; printing drawings in a separate companion volume to the volume containing textual matter; offering the GAZETTE in separate portions along broad subject lines based on its present subdivisions (General and Mechanical, Chemical, and Electrical), so that subscribers could obtain only that subject matter which might be of a particular interest, instead of having to purchase the entire issue; reverting to the publication of abstracts in view of the fact that the printing of claims increased the size of the GAZETTE by nearly 27% and, correspondingly, the cost of postage; together, these cost elements added to the subscription price increase. As a replacement for the GAZETTE for those desiring only the Official Notice Section, a pamphlet containing the pages, "Contents," "Official Notices" and "Patent Examining Filing Date of Oldest New Case" could be provided.

We have, also, explored the alternative publication form of microfiche and find that the entire GAZETTE, in its present format and content, could be offered for an annual subscription rate of $140. This new but widely used form of publication would reduce the annual cost of the OFFICIAL GAZETTE to an amount less than the former subscription rate; would offer space-saving convenience in storing copies for later reference; would reach you by first class mail, a fact that cannot be assured for the conventional publication in view of prospective further increases in postal rates, unless subscribers are willing to accept this element of greater cost. Microfiche distribution would not introduce any delay in availability of the OFFICIAL GAZETTE, as the film would be released for mailing simultaneously, on issue day, with printed copies; quite possibly the mailing time would be reduced because, being handled as first-class letter mail, the microfiche could be dispatched as air mail to more distant points. Subscribers whose organizations are already equipped with microfilm facilities could reproduce the microfiche for low cost additional dissemination within their organizations; subscribers who are not now so equipped, could find it profitable to explore the cost-saving aspects and other benefits offered by such equipment.

A number of the alternatives considered jointly by the Patent and Trademark Office and the U.S. Government Printing Office were found not to be feasible for one reason or another. For example, format and paper changes would entail major revisions in production methods and equipment which, for the expense and disruptions involved, afforded little basis of certain long-run benefit in lower subscription rates. Offering the OFFICIAL GAZETTE in separate sections (General and Mechanical, Chemical and Electrical), while reducing subscription costs to those who need only one or two sections, would raise Patent and Trademark Office costs an excessive amount. Some of the alternatives seem to be viable, but they need to be tested from the subscriber's point of view. Accordingly, there is presented, elsewhere in this issue of the OFFICIAL GAZETTE a survey form (PTO Temp. 218) which puts before the subscriber various choices to be made as measures for reducing the cost of obtaining information contained in weekly issues of the OFFICIAL GAZETTE.

The survey form, when completed by the subscriber to show his preferences, will be helpful to the Patent and Trademark Office in planning the actions it may take to serve its clientele and to assure that the OFFICIAL GAZETTES remain effective publications in disseminating information concerning newly issued patents and registered trademarks. Your cooperation and assistance in careful consideration of the alternatives offered, thoughtful election of choices, and expression of those choices on the survey form, will be helpful to the Patent and Trademark Office, as well as to your ultimate benefit.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Certificates of Correction for the Week of June 3, 1975

Re. 28,213	3,845,520	3,860,900	3,867,707
3,643,513	3,846,342	3,861,010	3,867,889
3,706,122	3,846,757	3,861,672	3,868,052
3,723,306	3,847,514	3,861,710	3,868,199
3,756,004	3,847,785	3,861,880	3,868,230
3,762,140	3,848,527	3,861,906	3,868,243
3,762,934	3,849,231	3,861,976	3,868,351
3,764,350	3,849,511	3,862,115	3,868,824
3,765,153	3,850,209	3,862,160	3,869,133
3,765,641	3,850,662	3,862,332	3,869,701
3,771,960	3,850,730	3,862,811	3,870,135
3,780,160	3,850,925	3,862,866	3,870,142
3,785,662	3,851,033	3,862,927	3,870,172
3,789,302	3,851,682	3,863,069	3,870,345
3,789,834	3,851,803	3,863,450	3,870,527
3,794,146	3,851,814	3,863,595	3,871,083
3,795,099	3,852,094	3,863,675	3,871,100
3,796,929	3,852,541	3,863,909	3,871,290
3,799,632	3,853,665	3,863,994	3,871,438
3,812,247	3,853,764	3,864,037	3,871,701
3,814,235	3,853,923	3,864,053	3,872,144
3,819,587	3,854,440	3,864,293	3,872,202
3,822,134	3,855,489	3,864,351	3,872,259
3,822,550	3,856,156	3,864,456	3,872,439
3,823,060	3,856,510	3,864,676	3,872,911
3,825,736	3,856,606	3,864,746	3,872,987
3,828,455	3,856,664	3,864,919	3,873,235
3,829,024	3,857,025	3,865,435	3,873,692
3,830,658	3,857,507	3,865,445	3,875,058
3,831,754	3,857,870	3,865,513	3,875,101
3,832,382	3,858,067	3,865,770	3,875,193
3,833,926	3,858,180	3,866,433	3,875,348
3,837,515	3,858,761	3,866,736	3,875,449
3,839,392	3,858,773	3,866,866	3,875,465
3,839,648	3,859,421	3,866,934	3,875,520
3,842,775	3,859,668	3,866,993	3,875,526
3,843,445	3,860,031	3,867,264	3,875,568
3,843,803	3,860,102	3,867,538	3,876,057
3,844,661	3,860,289	3,867,616	
3,845,115	3,860,336	3,867,621	
3,845,235	3,860,492		

As of July 1, 1975, reissue patents will be printed under the data base system and in the same general style and format presently in effect for invention patents. (See the Notice of July 16, 1970 published at 877 O.G. 1 for details of patent front page format.) However, for reissue patents the following modifications are necessary:

A. *Front Page*

- Use of the uppercase alpha code "E" with the INID Code [11] (for document number): This ICIREPAT alpha code, identifying the document as a reissue patent, is one of the "Standard Codes for Identification of Different Kinds of Patent Documents," which indicate levels of publication.
- Use of "REISSUED" preceding the date the patent was reissued.
- Addition of a new data element titled "Related U.S. Patent Documents" which is comprised of two categories of information:

1) "Reissue of:"—presenting data identifying the original patent being reissued. INID Code [64] is assigned thereto. (See Section 901.04 of the Manual of Patent Examining Procedure for a list with definitions of INID Codes (ICIREPAT numbers for identification of data).)

This information will appear on each reissue patent.

2) "U.S. Applications:"—presenting continuing application data which appears for invention patents under the data element "Related U.S. Application Data."

This information will appear when applicable.

B. *Drawings*

- Use of "REISSUED" instead of "PATENTED" at the top left of sheets of drawings.

C. *Specification*

- Presence of same preface paragraph formerly used for reissue patents to explain indicators (brackets and italics) of changes made by reissue.

The specimen which appears on opposite page illustrates the front page for reissue patents under the revised format.

Approved: May 6, 1975.

WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.

United States Patent [19]

Shook

[11] **B** **Re. 12,345**

[45] **Reissued Nov. 30, 1972**

[54] **REAR SUSPENSION MECHANISM**

[75] Inventor: **Howard E. Shook**, Xenia, Ohio

[73] Assignee: **Fox Equipment Company**, Xenia, Ohio

[22] Filed: **Dec. 24, 1971**

[21] Appl. No.: 999,999

Related U.S. Patent Documents

Reissue of:

[64] Patent No.: **3,999,999**
Issued: **Nov. 30, 1970**
Appl. No.: **999,999**
Filed: **Oct. 31, 1969**

[52] **U.S. Cl.**..... **180/5 R**; 280/25

[51] **Int. Cl.**²..... **B62E 27/02**; B62M 17/04

[58] **Field of Search**..... 180/5 R, 3, 4, 6; 280/25,12; 244/108, 105

SPECIMEN

[56] **References Cited**

UNITED STATES PATENTS

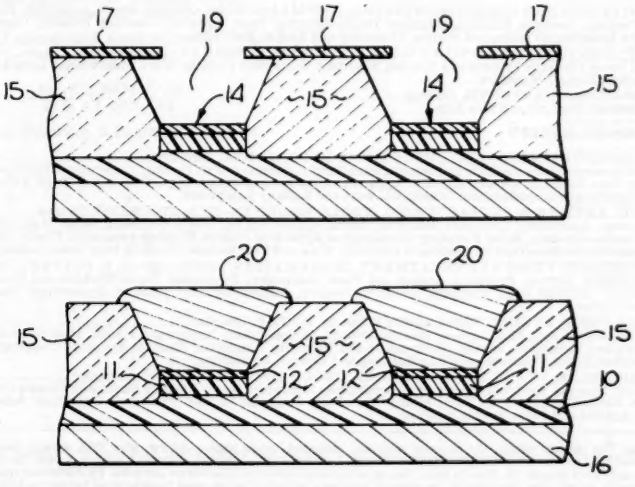
3,999,999	12/1932	Stalb	244/108
3,999,999	12/1932	Markey	244/108
3,999,999	1/1941	Smith	280/12 R X
3,999,999	2/1960	Laporte	180/5 R

Primary Examiner—Richard J. Johnson
Attorney, Agent, or Firm—Jones & Jones

[57] **ABSTRACT**

A single shot firing mechanism adapted to be concealed in an elongated rod normally utilized for an entirely different purpose comprising, a tubular housing forming a section of the rod, a barrel portion removably secured to the forward end of said housing for holding a cartridge in position to be fired, a forwardly biased striker longitudinally disposed in said housing for firing contact with the cartridge, a cylindrical sear secured to the rear end of said striker, a locking rod disposed in said housing in simultaneous contact with the breech face of said barrel portion and the front face of said sear for retaining said striker in a cocked position, a firing ring surrounding the junction of said housing and said rod for rotatable and slidable movement thereon, and means for transferring the rotation of said firing ring to said sear to release said striker for movement into firing contact with the cartridge.

21 Claims, 4 Drawing Figures



PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 10, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-24-74
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-22-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-21-74
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-3-74
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	6-7-74
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	11-6-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-8-74
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-5-74
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	10-15-74
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-8-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	2-4-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-12-74
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-3-74
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. PULFREY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-30-74
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	8-9-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	10-4-74

Expiration of patents: The patents within the range of numbers indicated below expire during May 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,832,959, to 2,836,825 inclusive
Plant Patents..... Numbers 1,698, to 1,713 inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED JUNE 3, 1975

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T935,001

SOFT ADHESIVE FOR TWO-ADHESIVE POLYESTER BAGS

Aurelius Franklin Chapman, 2417 Brookshire Drive, Wilmington, Del. 19803

Continuation of application Ser. No. 207,636, Dec 13, 1971. This application Jan. 2, 1974, Ser. No. 430,051

Int. Cl. B65d *33/20, 33/22;* **B32b** *7/14*
U.S. Cl. 229—53

No Drawing. 6 Pages Specification

A thermoplastic adhesive suitable for use as the inner shock-absorbing band in a double adhesive band bag closure comprising

(a) a polymer selected from the group consisting of plasticized polyvinyl acetate and plasticized polyacrylate wherein the plasticizer is present in an amount preferably ranging from 30 to 150 parts per 100 parts of polymer; and

(b) about 2 to 30 parts, preferably 5 to 15 parts, of a vinylidene chloride copolymer, per 100 parts of plasticized polymer, containing from about 40 to 85 weight percent vinylidene chloride.

T935,002

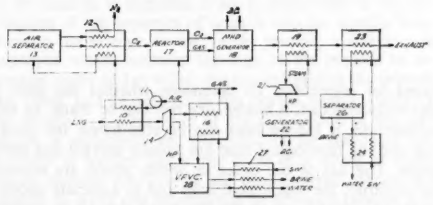
LIQUEFIED NATURAL GAS OXYGEN SEPARATION WATER DESALINATION AND ELECTRICAL GENERATION SYSTEM

Joseph Seliber, 313 Hibbard Road, Wilmette, Ill. 60091

Continuation of abandoned application Ser. No. 154,015, June 17, 1971. This application Jan. 31, 1974, Ser. No. 438,300

Int. Cl. B01d *3/10*
U.S. Cl. 203—11

1 Sheet Drawing. 8 Pages Specification



A combined system and method using liquefied natural gas for generating electricity and recovering potable water from saline water is provided. The liquefied natural gas cools air that is separated to produce oxygen that is combined with a portion of the vaporized natural gas for producing electricity preferably with a magnetohydrodynamic (MHD) generator. Additional refrigeration and kinetic energy gained from gas expansion are employed for vacuum freezing vapor compression desalination. Heat from the MHD generator may generate steam for producing additional electricity, and also heat water for vaporization desalination. Preferably a nuclear reactor is used for preheating oxygen and natural gas before reaction in the MHD generator.

T935,003

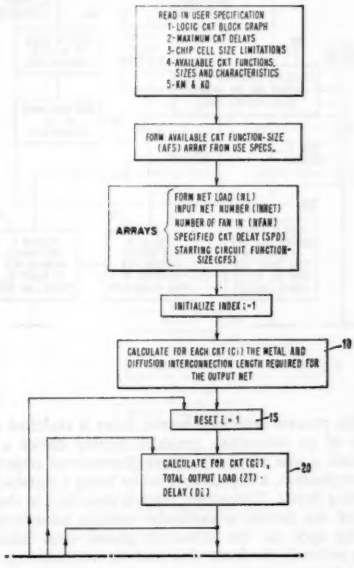
PROCESS FOR SELECTING CIRCUITS WITH OPTIMUM POWER AND AREA REQUIREMENTS

Thomas P. Linville, 2264 Brookside Ave., Yorktown Heights, N.Y. 10598, and Erwin Schischa, Peekskill, Gerhard R. Thompson, Mahopac, N.Y.

Continuation of abandoned application Ser. No. 214,143, Dec. 30, 1971. This application Feb. 19, 1974, Ser. No. 443,268

Int. Cl. G06f *15/06, 15/56*
U.S. Cl. 444—1

7 Sheets Drawing. 27 Pages Specification


READ IN USER SPECIFICATION
1-LOGIC CKT BLOCK GRAPH
2-MAXIMUM CKT DELAYS
3-CHIP CELL SIZE LIMITATIONS
4-AVAILABLE CKT FUNCTIONS, SIZES AND CHARACTERISTICS
5-AN & AD
FORM AVAILABLE CKT FUNCTION-SIZE (AFS) ARRAY FROM USE SPECS.
ARRAYS
FORM NET LOAD (NL)
INPUT NET NUMBER (INNET)
NUMBER OF FAN IN (NFAN)
SPECIFIED CKT DELAY (SPD)
STARTING CIRCUIT FUNCTION-SIZE (CFS)
INITIALIZE INDEX I=1
CALCULATE FOR EACH CKT (CI) THE METAL AND DIFFUSION INTERCONNECTION LENGTH REQUIRED FOR THE OUTPUT NET
19
RESET I = 1
15
CALCULATE FOR CKT (CI), TOTAL OUTPUT LOAD (ZT) - DELAY (DL)
20

This is an automatic process for selecting circuits to be placed on a large scale integrated (LSI) circuit chip. The

process selects a minimum circuit size which satisfies the power and timing requirements of the individual circuits on the chip. Minimization is achieved by selecting from user specification lists, that circuit which satisfies the requirements. The large scale integrated circuit chip resulting from the design process contains field effect transistor circuits of different physical size. By matching the required power and timing with a satisfactory circuit, the LSI chip is more highly compacted in the number of circuits and performance available within the chip structure.

T935,004

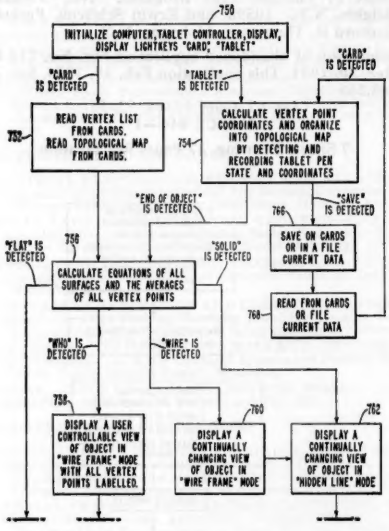
PROCESS FOR THE INTERACTIVE DESIGN OF POLYHEDRA

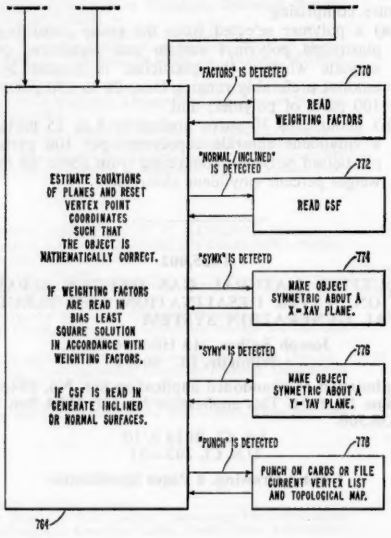
Arthur Appel, 1512 Indiana Ave., Yorktown Heights, N.Y. 10598, Arthur J. Stein, 35 Wheeler Drive, Peekskill, N.Y. 10566

Continuation of abandoned application Ser. No. 318,452, Dec. 26, 1972. This application May 17, 1974, Ser. No. 471,090

Int. Cl. G06f *15/20*
U.S. Cl. 444—1

38 Sheets Drawing. 82 Pages Specification


750
INITIALIZE COMPUTER, TABLET CONTROLLER, DISPLAY, DISPLAY LIGHTKEYS "CARD", "TABLET"
"CARD" IS DETECTED
"TABLET" IS DETECTED
"CARD" IS DETECTED
752
READ VERTEX LIST FROM CARDS. READ TOPOLOGICAL MAP FROM CARDS.
754
CALCULATE VERTEX POINT COORDINATES AND ORGANIZE INTO TOPOLOGICAL MAP BY DETECTING AND RECORDING TABLET PEN STATE AND COORDINATES
"END OF OBJECT" IS DETECTED
"SAVE" IS DETECTED
766
SAVE ON CARDS OR IN A FILE CURRENT DATA
"FLAT" IS DETECTED
756
CALCULATE EQUATIONS OF ALL SURFACES AND THE AVERAGES OF ALL VERTEX POINTS
"SOLID" IS DETECTED
768
READ FROM CARDS OR FILE CURRENT DATA
"WHO" IS DETECTED
"WIRE" IS DETECTED
758
DISPLAY A USER CONTROLLABLE VIEW OF OBJECT IN "WIRE FRAME" MODE WITH ALL VERTEX POINTS LABELLED.
760
DISPLAY A CONTINUALLY CHANGING VIEW OF OBJECT IN "WIRE FRAME" MODE
762
DISPLAY A CONTINUALLY CHANGING VIEW OF OBJECT IN "HIDDEN LINE" MODE

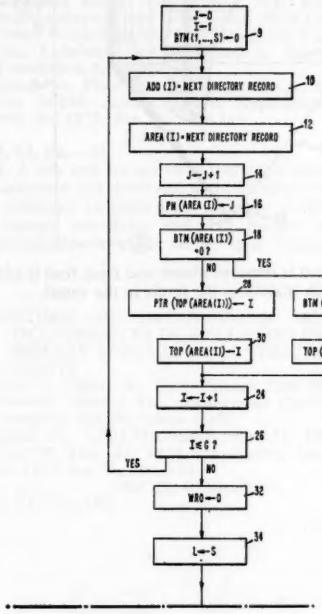

"FACTORS" IS DETECTED
770
READ WEIGHTING FACTORS
"NORMAL/INCLINED" IS DETECTED
772
READ CSF
ESTIMATE EQUATIONS OF PLANES AND RESET VERTEX POINT COORDINATES SUCH THAT THE OBJECT IS MATHEMATICALLY CORRECT.
IF WEIGHTING FACTORS ARE READ IN BIAS LEAST SQUARE SOLUTION IN ACCORDANCE WITH WEIGHTING FACTORS.
IF CSF IS READ IN GENERATE INCLINED OR NORMAL SURFACES.
"SYMX" IS DETECTD
774
MAKE OBJECT SYMMETRIC ABOUT A X=XAV PLANE.
"SYMY" IS DETECTED
776
MAKE OBJECT SYMMETRIC ABOUT A Y=YAV PLANE.
"PUNCH" IS DETECTED
778
PUNCH ON CARDS OR FILE CURRENT VERTEX LIST AND TOPOLOGICAL MAP.
764

In the process described herein, there is sketched on the screen of an interactive graphics display device a front view and a side view of a three-dimensional object such as a polyhedron, a capacitance tablet being a suitable input sketching device. Thereafter, there is described in the front view of the device, a particular surface boundary. The tracking spot on the screen is placed over successive vertex points in the front view and the interactive graphics device lightpen switch is closed at every vertex point. Thereby, there is recorded from the tracking spot position, the Y and Z coordinates of the vertex point in the order in which these points are entered. Next, the same surface is described in the right side view by selecting the vertex points in the same order. A computer determines the X coordinate in this view and since the order of entering data is the same in both views, X values can be assigned to the correct vertex point. The order in which points are entered is the topological map for the surface and the coordinates of all vertex points are known. If the tracking spot is detected in the right-half of the screen, encoded points are treated as being in the right side view. When the number of points entered for a particular surface on the right side view equal the number of points entered for a particular surface on the front view, the topological description of that surface is completed and an isometric drawing of that surface is projected. Thereafter, another surface is encoded. In the computer, there are compared encoded vertex points to all previously entered points to determine if a new point is within a small error distance of any other point. If it is, then the new vertex point is to be replaced with the previously entered point in the topological map. After an object is completely encoded, in accordance with the process, the orthographic view of the solid object can be rotated for inspection. To determine whether the solid is perfectly encoded, a hidden line test can be made. In this connection, if hidden lines can be eliminated, the vertex list and the topological map are usually correct and complete. The use of the order in which points are entered to construct the topological map and to associate coordinates of points between the front and side views enables complete freedom in the type of polyhedra which can be encoded and the type of graphic material being traced. The process can, therefore, be employed to calculate coordinates and the tedious work of writing down the vertex list and the topological map is eliminated. The process is particularly applicable in numerical control techniques.

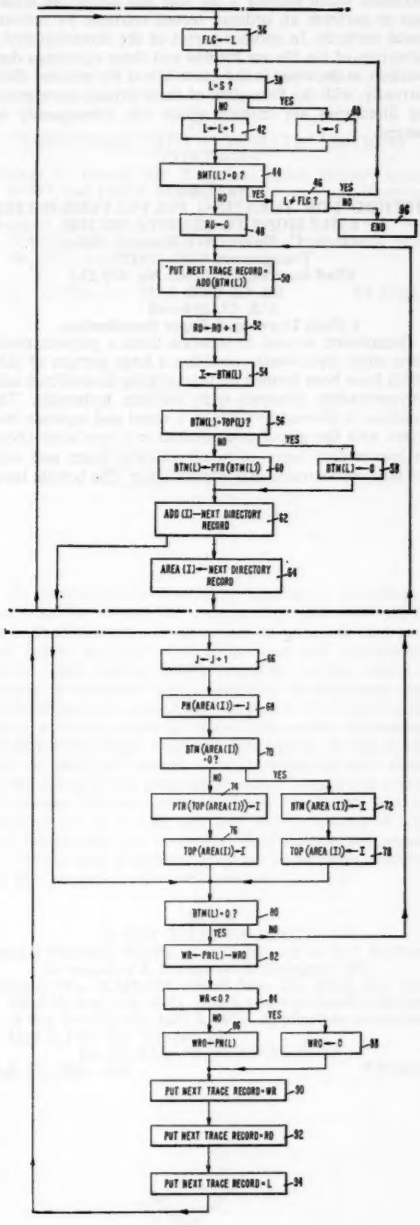
T935,005
PROCESS FOR THE SEQUENTIAL RECOVERY OF THE RECORDS OF A FILE

Brian T. Bennett, Wenonah Trail, Mohegan Lake, N.Y. 10547, and Archie C. McKellar, 100 Diplomat Drive, Apt. 3C, Mount Kisco, N.Y. 10549

Continuation of application Ser. No. 208,547, Dec. 16, 1971. This application June 7, 1974, Ser. No. 477,373.
Int. Cl. G06f 7/06
U.S. Cl. 340—172.5
41 Sheets Drawing. 6 Pages Specification



A process is disclosed for the sequential recovery of the records of a file wherein the records are randomly located on a storage device which comprises a plurality of areas. The process is based upon the principle that the recovery of the records in sequence order is isomorphic to the distribution of the sequence of records into the specific locations on the storage device. In the process, a directory is employed which contains the tags of the records in sequential order of key value, the tag comprising the records key value, and its address in the storage device. Utilizing the directory, a simulation of the distribution of the tags therein is performed and the result of the simulated distribution is written out in the form of a string of items which includes portions of the tags grouped therein according to areas and information as to which records and how many are to be written out at respective visits to the storage device. The items in the string are then employed in the reverse order of their writing out to determine the recovery or retrieval of the records in sequential order of key value. In one aspect of the invention, the record recovery may be performed by scanning the areas of the storage device in a cyclic fashion. In another aspect, the record recovery may be achieved by selectively visiting chosen areas of the storage device, the determination of the selection of the area which may be visited at a particular juncture depending upon predetermined criteria



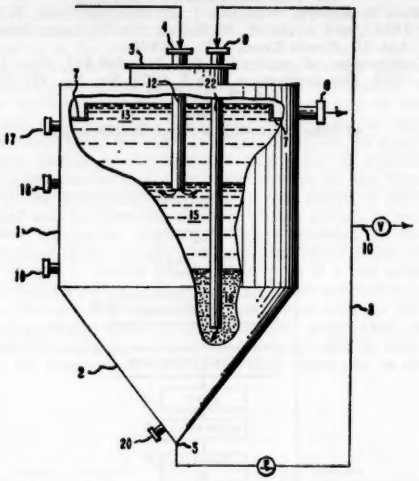
such as quantity of records that can be written out at a visit, etc. The process can be accomplished either by a single or multi-pass operation. The process is a substantial improvement over other sequential record recovery processes which employ a tag sort and utilize the sorted tags to perform an ordered record retrieval by conventional methods. In another aspect of the invention, order substrings of the file are formed and these substrings then function as the areas in the execution of the process. Concurrently, with the formation of these strings, corresponding directories are created which can subsequently be merged.

T935,006
METHOD FOR TREATING POLYGLYCOL-WATER EMULSIONS TO REMOVE SOLIDS

Melvin C. Baker, 377 Howard Drive, Youngstown, N.Y. 14174

Filed June 14, 1974, Ser. No. 479,513
Int. Cl. C02b *1/20*
U.S. Cl. 210—45
1 Sheet Drawing. 9 Pages Specification

Decantation is used to separate from a polytetramethylene ether glycol-water emulsion a large portion of salts which have been formed by precipitating fluosulfonic acid polymerization catalysts with calcium hydroxide. The emulsion is allowed to settle in a vessel and separate into layers with the glycol concentrated in a top layer above an intermediate layer of relatively clear water and with the salts concentrated in a bottom layer. The bottom layer is removed continuously with part of it being recirculated back into the bottom layer at a rate which avoids clogging. The glycol is removed above, and fresh feed is added at a rate which maintains the levels in the vessel.



REISSUES

JUNE 3, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

28,435
APPLE TREE

Daniel F. Dayton, Urbana, and James B. Mowry, Carbondale, Ill., L. Fredrick Hough, Bloomsbury, and Catherine Bailey, Englishtown, N.J., Edwin B. Williams, Lafayette ,and Jules Janick ,West Lafayette, Ind., James Ralph Shay, Corvallis, Oreg. and Frank H. Emerson, Lafayette, Ind. assignors to Purdue Research Foundation, Lafayette, Ind.

Original No. Plant Pat. 3,134, dated Apr. 25, 1972, Ser. No. 54,090, June 17, 1970. Application for reissue July 28, 1972, Ser. No. 276,165

Int. Cl. A01h *5/03*

U.S. Cl. Plt.—34 1 Claim

1. A new and distinct variety of apple tree substantially as described and illustrated and particularly characterized by resistance to apple scab, excellent fresh fruit quality as regards rich flavor and crisp texture, and maturing approximately 4 weeks earlier than "Delicious."

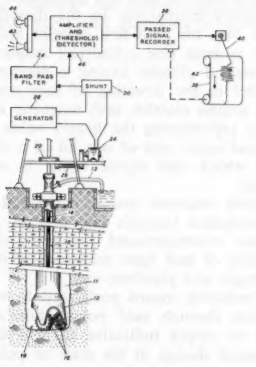
28,436
METHOD OF DETERMINING DOWNHOLE OCCURRENCES IN WELL DRILLING USING ROTARY TORQUE OSCILLATION MEASUREMENTS

Albert L. Vitter, Jr., New Orleans, and Hugh G. McDonald, Monroe, La., assignors to Chevron Research Company, San Francisco, Calif.

Original No. 3,703,096, dated Nov. 21, 1972, Ser. No. 101,739, Dec. 28, 1970. Application for reissue July 23, 1973, Ser. No. 381,956

Int. Cl. E21b *47/00*

U.S. Cl. 73—151 18 Claims



1. The method of determining bit damage in rotary drilling comprising rotating a drill string having a bit attached thereto in a hole and monitoring the rotary torque for characteristic oscillations, said characteristic oscillations having a frequency not more than twice and not less than half the expected frequency of torsional oscillation of the drill string, and said characteristic oscillations having an amplitude substantially in excess of the oscillations produced while rotating an undamaged bit.

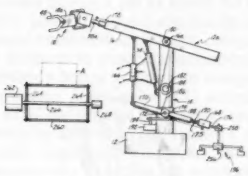
28,437
WORK-HEAD WITH AUTOMATIC MOTIONS CONTROLS

George C. Devol, 990 Ridgefield Road, Wilton, Conn. 06897, and Paul S. Martin, 189—54 43 Road, Flushing, N.Y. 11358

Original No. 3,543,910, dated Dec. 1, 1970, Ser. No. 748,703, July 30, 1968. Application for reissue Nov. 30, 1972, Ser. No. 310,769

Int. Cl. B65g *47/08*

U.S. Cl. 198—34 68 Claims



56. Automatically controlled apparatus, including a work device, means for transporting said work device through three-dimensional ranges of positions, and control means for said work device and said transporting means, said control means including a first source of control information for determining a prescribed program of motions of said work device in three-dimensonal space, a further source of control information independent of said transporting means for generating, during operation of said first source, offset information that varies in the course of the program provided by said first source of control information, and means combining and responsive jointly to said first and further sources of control information for controlling said transporting means to execute said prescribed program of motions modified by the generated offset information.

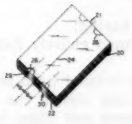
28,438
X-RAY FILM PACKAGE

Gunter Schmidt, Malibu, Calif., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Original No. 3,741,386, dated June 26, 1973, Ser. No. 136,530, Apr. 22, 1971, which is a continuation-in-part of Ser. No. 52,980, July 7, 1970. Application for reissue May 2, 1974 Ser. No. 466,402

Int. Cl. B65d *85/00, 85/30, 85/62*

U.S. Cl. 206—455 7 Claims

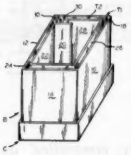


1. A film package for use in a daylight handling system, said package comprising

a. a plurality of substantially identical photographically sensitive film sheets, each sheet having a *single* cut-away portion of small area along an edge thereof, said sheets being stacked in alternating superposition whereby the cut-away portions of alternate sheets form discontinuous, [spaced apart,] parallel rows *which are spaced equidistant from opposite sides of a center line perpendicular to a common edge of said stack;* and

b. cover means opaque to actinic radiation surrounding said stack.

28,439
HEAVY DUTY CONTAINER
Charles J. Shepherd, Pasadena, Tex., assignor to Container Corporation of America, Chicago, Ill.
Original No. 3,726,467, dated Apr. 10, 1973, Ser. No. 217,090, Jan. 12, 1972. Application for reissue Aug. 23, 1974, Ser. No. 499,831
Int. Cl. B865d *5/00, 13/00*
U.S. Cl. 229—23 R **9 Claims**



1. An improved corner construction for a heavy duty shipping container having a tubular body and end closure means for closing the ends of said body wherein said body comprises:

a. a pair of first and second tubes, formed from paperboard and adhesively secured to each other in telescoping relation, each of said tubes including five panels hingedly attached along parallel fold lines, wherein:

i. each of the three center panels has a width corresponding substantially to the width of one of three walls of said body;

ii. the two end panels have a combined width substantially equal to at least the width of the fourth wall of said body with one of said end panels being relatively wide and the other panel being relatively narrow;

b. said tubes being disposed one within the other, with the three center panels of each tube positioned in face-to-face relation to provide double-ply thickness for said three walls of said body;

c. said fourth wall of said body being double-ply in thickness throughout the majority of its width and having a joint section at one side thereof, adjacent one corner of said body which is triple-ply in thickness;

d. said fourth wall having:

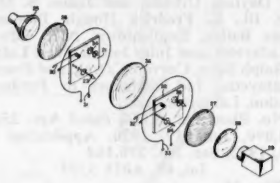
i. one ply formed entirely from one of the wide end panels;

ii. another ply formed from the other of the wide end panels and one of the narrow end panels having adjacent end edges forming a butt-joint;

iii. a securing flap formed from the other narrow panel and extending from said corner beyond said butt-joint;

e. said securing flap being located outwardly of said one ply and said other ply.

28,440
MAGNETO-OPTICAL CYLINDRICAL MAGNETIC DOMAIN MEMORY
Jon H. Myer, Woodland Hills, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Original No. 3,806,903, dated Apr. 23, 1974, Ser. No. 205,095, Dec. 6, 1971. Application for reissue May 23, 1974, Ser. No. 472,766
Int. Cl. G11c *11/14, 11/42*
U.S. Cl. 340—174 YC **23 Claims**



1. A magneto-optical signal translating device for binary digital signals comprising:

a. first and second optically translucent uniaxially anisotropic ferromagnetic crystal platelets of equal thickness, one of the major plane surfaces of each of said platelets being juxtaposed in light transmitting relationship to a major plane surface of the other of said platelets, and each of said platelets having an easy axis of magnetization perpendicular to the plane of said major surface of said platelet;

b. means to magnetically bias said first and second platelets respectively in opposing polarities along said easy axes of magnetization so that their respective Faraday rotations will normally compensate each other;

c. means to transilluminate and optically superimpose in registration said pair of platelets with a beam of polarized light;

d. means to establish at least one movable cylindrical magnetic domain in said first platelet having a magnetic polarity antiparallel to the direction of said magnetic bias for said first platelet and means to establish at least one cylindrical magnetic domain in said second platelet having a magnetic polarity antiparallel to the direction of said magnetic bias for said second platelet, said magnetic domains respectively representing the binary value of one bit of a digital signal and of one bit of a digital reference to which said digital signal is subtractively compared;

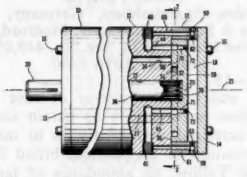
e. polarization analyzer means positioned to receive light transmitted through said pair of platelets to detect any uncompensated change in the state of polarization of said light produced by its transmission through said platelets; and

f. light transducing means positioned to receive light transmitted through said polarization analyzer to produce an output indicative of said detected uncompensated change in the state of polarization.

28,441
HIGH PRESSURE EXPANSIBLE CHAMBER DEVICE
Wayne B. Easton, 3007 W. 96th St. Circle, Bloomington, Minn. 55431
Original No. 3,687,581, dated Aug. 29, 1972, Ser. No. 106,047, Jan. 13 1971. Application for reissue July 18, 1974, Ser. No. 489,525
Int. Cl. F01c *21/00;* **F03c** *3/00;* **F04c** *15/00*
U.S. Cl. 418—270 **5 Claims**

2. A fluid pressure operated device of the expansible chamber type comprising a casing, a valve block having a

fluid transfer surface, said valve block having a plurality of expansible chamber feeding and exhausting passages having openings in said transfer surface, a valve having a first surface engaging said transfer surface, said valve first surface being recessed to form *a* [reversible] feeding [and exhausting sections] *section*, [reversible] *an* inlet [and outlet passages] *passage* in said valve block having [openings] *an opening* in said transfer surface and [respective] constant fluid communication with said feeding [and exhausting sections] *section* of said valve, said valve block inlet passage and said valve feeding section forming fluid inlet path means, [said valve block outlet passage and said valve exhausting section forming fluid outlet path means,] said valve being cyclically movable relative to said transfer surface with said feeding [and exhausting sections] *section* thereof sequentially feeding [and exhausting] said expansible chamber passages, *means for sequentially exhausting said expansible chamber passages,*



said valve having a second surface on the opposite side thereof from said first surface, a valve biasing pressure chamber formed by an internal surface of said casing and said second valve surface, passage means between [each of] said fluid inlet [and outlet] path means and said pressure chamber [, check valve means] for [said passage means] allowing fluid therein to flow [in only one direction] to said pressure chamber for biasing said valve towards said valve block transfer surface, [said valve biasing pressure chamber having no openings other than openings for said check valve means,] *said valve being the only cyclically movable member with which pressurized fluid in said chamber has contact,* and drive means attached to said valve and extending in a direction away from said valve biasing pressure chamber, said second valve surface being between said drive means and said valve biasing pressure chamber.

28,442

RADIOIMMUNOASSAY OF ANGIOTENSIN AND RENIN ACTIVITY

Robert L. Wolf, New York, N.Y., assignor to Mount Sinai School of Medicine of the City University of New York, New York, N.Y.

Original No. 3,592,888, dated July 13, 1971, Ser. No. 699,098, Jan. 19, 1968. Application for reissue Sept. 7, 1972, Ser. No. 286,983

Int. Cl. A61k *27/04;* **G01n** *23/00*

U.S. Cl. 424—1 **10 Claims**

1. A process for assaying angiotensin activity comprising the following steps: (1) preparing an amount of antibody to angiotensin coupled to poly-L-lysine; (2) labeling an amount of angiotensin with radioactivity; (3) preparing solutions containing varying known amounts of unlabeling angiotensin, a [quatity] *quantity* of the antibody and a quantity of labeled angiotensin in order to form mixtures having a pH of about 7.0 to 9.5 containing radioactive antibody-bound angiotensin complexes and antibody-bound unlabeled angiotensin complexes; (*4*) subjecting said mixtures to paper radioelectrophoresis to separate the antibody-bound angiotensin complexes from the free angiotensin on paper strips; (*5*) counting the radioactivity in both bound and free angiotensin groups on the paper strips to determine the ratios of the radioactive antibody-bound angiotensin complexes to the radioactive free angiotensin; (*6*) [plotting on a graph] *referencing* the ratios of bound to free radioactive angiotensin [as a function of] *to* the known amounts of angiotensin in [each of the] *said* mixtures to establish a [line graph showing the] relationship between the ratio of bound to free angiotensin and the concentration of angiotensin; (*7*) repeating [the process recited] *steps* (*1*) *to* (*5*), *inclusive,* above using an unknown amount of unlabeled angiotensin in [said] *a* mixture to determine the ratio of bound labeled angiotensin to free labeled angiotensin *in said mixture;* and (*8*) [locating the ratio on the line graph] *using the relationship previously established according to step* (*6*) to determine the concentration of the unknown amount of angiotensin.

PLANT PATENTS

GRANTED JUNE 3, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,724
ROSE PLANT
Reimer Kordes, Sparrieshoop, Germany, assignor to Jackson & Perkins Company, Medford, Oreg.
Filed Feb. 11, 1974, Ser. No. 441,381
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—28 **1 Claim**

1. A new and distinct cultivar of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a bushy, compact plant, high production of cut flowers in the greenhouse, large oval leaflets, and a clear, bright flower color of Yellowish-Red 7.5 R 5/12.

3,725
ROSE PLANT
Hideharu Henry Kuramoto, Salinas, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.
Filed Feb. 25, 1974, Ser. No. 445,573
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—22 **1 Claim**

1. A new and distinct cultivar of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by being substantially identical with its parent cultivar, Woburn Abbey, U.S. Plant Pat. 2,319, but being distinguished therefrom by its flower color of between Grenadine Red and Mars Orange on both sides of the petals.

3,726
ROSE PLANT
Reimer Kordes, Sparrieshoop, Germany, assignor to Jackson & Perkins Company, Medford, Oreg.
Filed Mar. 7, 1974, Ser. No. 449,070
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—15 **1 Claim**

1. A new and distinct cultivar of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its pointed, broad based bud of bright Lemon Yellow; an abundance of large, leathery, non-glossy foliage; well branched habit of growth; medium stem length of its cut flowers; high centered imbricated form of blooms; a petal count of 30 to 35; and very little fragrance.

PATENTS

GRANTED JUNE 3, 1975

ERRATA

For CLASS	See PATENT NO.
017–011	3,886,635
228–182	3,886,646
228–175	3,886,647
228–112	3,886,649
228–136	3,886,650
228–103	3,886,651
173–159	3,886,999
223–028	3,887,118
239–676	3,887,153
251–339	3,887,165
260–209.6	3,887,175
432–152	3,887,266
250–458	3,887,271
416–145	3,887,296
416–220	3,887,298
148–031.57	3,887,395
250–338	3,887,471
250–345	3,887,473
260–340.7	3,887,472
264–066	3,887,524
264–316	3,887,579
252–319	3,887,580
252–531	3,887,614
425–260	3,887,685
191–001 A	3,887,776
339–014 R	3,887,895
340–003 R	3,887,896
340–007 R	3,887,897
260–008	3,887,940

PATENTS

GRANTED JUNE 3, 1975

GENERAL AND MECHANICAL

3,886,596

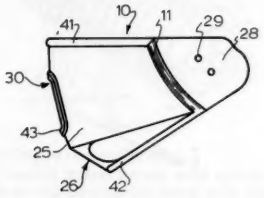
FACE GUARD FOR A BASEBALL HELMET OR THE LIKE

Charlotte S. Franklin, and Burton P. Franklin, both of Danville, Va., assignors to Cav, Inc., Bent Mountain, Va.

Filed Jan. 8, 1973, Ser. No. 321,745

Int. Cl. A41d *13/00*

U.S. Cl. 2—9 **3 Claims**



1. In a protective face guard for a game using a ball or like struck play piece in combination with an integral helmet having a protective dome, a bill and a pair of ear pieces, each having a forward outwardly curved edge and a plurality of apertures behind such edge, comprising:

a. a relatively thin lightweight sheet of molded transparent thermoplastic material having:

1. an upper section protective of the mouth, nose and cheeks of the wearer providing an unbroken exterior surface of predetermined generally outward curvature and including a centrally disposed breathing aperture and

2. a lower section protective of the jaw and lower pallet areas of the wearer providing an unbroken exterior surface of predetermined generally outward curvature depending beneath and angled rearwardly from said first section and formed integral therewith;

b. end pieces located at respective opposite ends of and molded integral with said first and second curved sections and each having plural mounting apertures, said end pieces being formed with inwardly curved force transmitting and distributing ledge surfaces mating with said forwardly outwardly curved helmet ear piece edges with said end pieces plural mounting apertures being located behind said ledge surfaces and mating with said helmet ear piece apertures; and

c. connector means mounted in said apertures and securing said face guard end pieces adjacent said helmet ear pieces, each said inwardly curved face guard end piece force transmitting ledge surface mating with and engaging a respective one of said outwardly curved helmet ear piece edges and being plurally secured at points behind said ledge surfaces and in such engagement wherein the force of impact of the play piece on either of said sections is transmitted through said engaged curved end piece and helmet ear piece surfaces.

3,886,597

FACE MASK AND PROCESS FOR MAKING FACE MASKS

Jacques-Philippe Dupre, 8, Rue de Levis, Paris 17 eme, France

Filed Apr. 30, 1973, Ser. No. 355,435

Claims priority, application France, May 4, 1972, 72.15892

Int. Cl. A61b *19/00*; **A42b** *1/18*

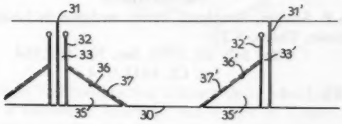
U.S. Cl. 2—206 **10 Claims**

1. A method of making face masks for surgical, medical or other protective use comprising the steps of:

folding a rectangular blank of porous thermoplastic material about a line parallel to a pair of the opposite margins of said blank to form a double thickness of the material;

severing by die cutting said two thicknesses of folded material adjacent the respective end margins transverse to said first mentioned margins along respective pairs of lines of severance;

one of each of said respective pairs of lines of severance being parallel with and spaced from a respective transverse margin to define a pair of handles to engage the ears of a wearer when the blank is unfolded;



the other of each of said respective pairs of lines of severance intersecting said line of folding at a point spaced inwardly from the first line of severance and also intersecting the first line of severance at a point spaced from the line of folding to define an area of material to be removed;

joining said two thicknesses of material together along at least a portion of the second line of severance by thermal welding.

3,886,598

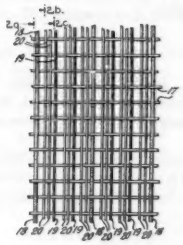
NARROW ELASTIC FABRIC FOR APPAREL WAISTBANDS

Roger G. Campbell; Richard E. Goff, Jr., both of Barrington, and Normand D. Guay, Woonsocket, all of R.I., assignors to Johnson & Johnson, New Brunswick, N.J.

Division of Ser. No. 370,103, June 14, 1973. This application July 31, 1974, Ser. No. 493,441

Int. Cl. A41f *9/00*

U.S. Cl. 2—237 **2 Claims**



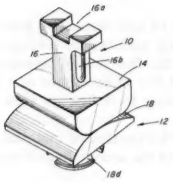
1. In a pair of trousers made from stretchable material, said trousers having an inwardly folded edge portion about the waist thereof, a waistband attached to said folded edge comprising a thin lightweight narrow elastic fabric having a face surface and a back surface, said fabric comprising a set of monofilament filling yarns running in the transverse direction of the fabric and a set of warp yarns running in the longitudinal direction of the fabric said set of warp yarns comprising elastic yarns, stretch synthetic yarns and nonelastic yarns, there being twice as many stretch synthetic yarns as there are elastic yarns in the warp set and three times as many nonelas-

tic yarns as there are stretch yarns in the warp set, said nonelastic yarns being woven with said filling yarns in a twill weave to form the face surface of said fabric, said face surface being primarily composed of said nonelastic yarns to form a twill pattern on the face surface, said stretch synthetic yarns and said elastic yarns being woven with said filling yarns in a plain weave with at least two stretch synthetic yarns being disposed between adjacent elastic yarns to form the back surface of said fabric, said elastic yarns forming a complimentary diamond pattern on the face surface of said fabric whereby the filling yarns are covered and stabilized in the fabric and rollover of the waist encircling portion of the trousers is prevented.

3,886,599
SURGICALLY IMPLANTABLE TOTAL ANKLE PROSTHESIS

Allen P. Schlein, Stratford, Conn., assignor to Louis Charles Schlein, Union, N.J.

Filed July 25, 1974, Ser. No. 491,754
Int. Cl. A61f *1/24*
U.S. Cl. 3—1 **6 Claims**



1. Prosthesis for total replacement of the ankle joint of humans comprising,

first and second bearing members each having a convex surface and adapted to engage each other along a line contact, said first bearing member being formed of a metal alloy which is essentially non-reactive with body tissue and having a stem adapted to be received in a cavity formed in the tibia, and

said second bearing member being formed of high density plastic material and including an integral shank adapted to be received in a cavity formed in the surface of the head of the talus.

3,886,600
JOINT PROSTHESIS

Paul Kahn, San Francisco, and James A. Stubstad, Lafayette, both of Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.

Continuation-in-part of Ser. No. 162,936, July 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 60,804, Aug. 4, 1970, abandoned. This application Sept. 26, 1973, Ser. No. 401,021
Int. Cl. A61f *1/24*
U.S. Cl. 3—1 **38 Claims**

1. A prosthesis for replacement of a skeletal hinged joint, comprising:

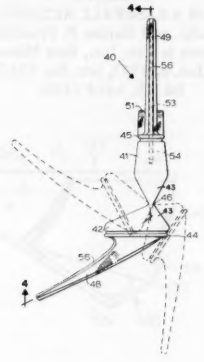
first and second stems each adapted to be inserted into a medullary canal of a bone of said joint, and

a flexing web integral with said stems, joining said stems and acting as a hinge to enable the first and second stems to swing relatively to each other,

said stems lying in a common plane and inclined to each other to make an included angle, with said web at the vertix, which in its at-rest non-flexed position is between 90° and 160°,

each said stem and said web having a reinforcing core and a cushioning coating of elastomer,

each said stem but not said web also having an outer layer with an open-pore three-dimensional reticular structure adapted to receive host tissue ingrowth,

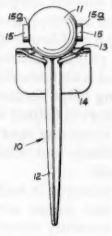


said core being continuous through said stems and web and comprising a series of longitudinally extending cords which at said web are coplanar to increase lateral stability.

3,886,601
PROSTHETIC KNEE JOINT ASSEMBLY

Eric George Findlay, 66 Barley Ln., Kingsthorpe, England

Continuation of Ser. No. 347,461, April 3, 1973, abandoned. This application Sept. 9, 1974, Ser. No. 504,123
Claims priority, application United Kingdom, Mar. 4, 1972, 10207/72
Int. Cl. A61f *1/24*
U.S. Cl. 3—1 **7 Claims**



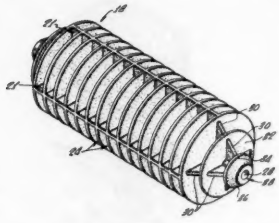
1. A prosthetic knee joint assembly comprising first and second joint members respectively formed to be rigidly attached to the femur and tibia to be interconnected by the joint, wherein a ball on the first member is adapted to fit for rocking movement within a socket of the second member which socket extends over more than 180° of arc with respect to the axis of rocking so as to support the suspended weight of the lower leg and resist dislocation of the joint following snap-engagement of the ball in the socket for bearing compressive forces acting on the joint and there being a pair of diametrally extending cylindrical trunnions projecting on opposite sides of the ball on a common lateral axis thereof to be received in corresponding recesses in a rim of the socket for limiting relative angular movement between the members in two opposite directions, said recesses consisting of cut-outs in said rim breaking the continuity of said socket so as to permit escape of fluid from the socket as said snap-engagement takes place.

3,886,602

WAVE QUENCHING DEVICE

David A. Stanwood, West Covina, Calif., assignor to Baker Hydro, Inc., Irvine, Calif.

Filed Mar. 28, 1974, Ser. No. 455,630
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172 23 Claims



1. A wave quelling device comprising:

a plurality of spaced wafers having axial apertures to accommodate an axis member on which they rotate; and

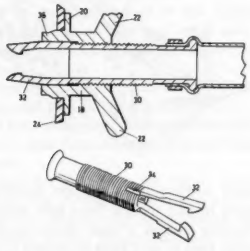
means for dividing the space between adjacent wafers into pockets comprising a plurality of barrier elements extending transversely between confronting surfaces of adjacent wafers, at least one of said barrier elements being above the surface of the water so that turbulence in the water such as waves impinges on the barrier elements exposed above the surface of the water which extend substantially entirely across the space between adjacent wafers and imparts to the device rotation about the axis, which rotation is resisted by submerged barrier elements to dampen the wave action.

3,886,603

DEVICE TO FACILITATE THE CLEARANCE OF A BLOCKED DRAIN

Roberto Carlo Onesta, 97 Corlett Dr., Birnam, Johannesburg, Transvaal, South Africa

Filed Mar. 13, 1973, Ser. No. 340,752
Claims priority, application South Africa, Mar. 14, 1972, 72/1758; Aug. 14, 1972, 72/5562
Int. Cl. E03d *11/00*
U.S. Cl. 4—255 4 Claims



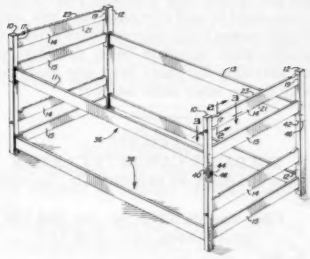
1. Apparatus for clearing a blocked drain consisting of a plug having a body adapted to close and opening into the drain, a core, including two opposed resilient hooked formations which are integrally formed with the core and which project from its one end, passing through and movable relatively to the body towards and away from each other, the formations being adapted to be moved towards and away from each other by the body to engage and release respectively fixed structure in the drain when the body is moved longitudinally relatively to the core and means on the body to move the body relatively to the core.

3,886,604

BUNK BED CONSTRUCTION

Tom Ewing, 1950 W. Broadway, Phoenix, Ariz. 85041

Filed Sept. 17, 1973, Ser. No. 398,217
Int. Cl.[2] A47C *13/38*
U.S. Cl. 5—8 6 Claims



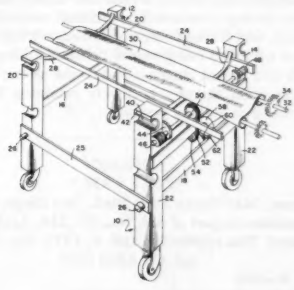
1. In a bunk bed construction wherein there is a headboard assembly; a footboard assembly and a pair of longitudinal frame members interconnecting the headboard and footboard assemblies the combination of a pair of substantially vertical posts in each of said assemblies; at least one cross-board between each pair of posts; each cross-board having a lower edge and opposite ends said opposite ends abutted to respective ones of said posts; said cross-board having a groove in said lower edge; a high tensil strength rod in said groove; said rod having opposite ends extending into respective ones of said pair of posts and secured thereto, said rod having a nut screw threadably engaged with at least one of said ends of said rod, said nut abutted to a respective one of said posts and adapted to place said rod in tension and said cross-board in compression between said pair of posts; said posts are provided with inner and outer sides; said inner sides abutted against ends of said cross-boards; said outer sides of said posts having recesses about the ends of the respective rods; said recesses each adapted to contain one of said nuts; and a bore in each post through which said rod extends said bore being of smaller diameter than the respective one of said recesses; and a shoulder area at the juncture between said bore and respective recess; said nut being supported by said shoulder area.

3,886,605

BED DEVICE FOR MOVING PATIENT

Joe F. Harris, Albion, Ill., assignor to J. David Harris, Albion, Ill.

Filed Sept. 10, 1973, Ser. No. 395,762
Int. Cl.[2] A61G *1/02*
U.S. Cl. 5—81 R 6 Claims



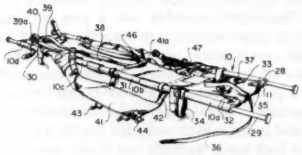
1. A portable and separate self contained unit for a hospital bed for setting up by a bed and out of contact therewith,

comprising a frame with a head section and a foot section both sections comprising spaced apart vertical posts joined together by transverse members, slot means in said posts to receive separate side members therein to connect the head and foot section thereto, said separate side members comprising a pair of elongated rotatable shaft members, a pair of short and a pair of long side members, for attachment to said post below said slot means, and a flexible patient carrying sheet member connected to said elongated rotatable members, said sheet carrying means being provided with driving means, and said rotatable shaft members being provided with driven means for uncoiling the sheet from one shaft member and coiling it up on the other shaft member.

3,886,606
FOLDABLE CASUALTY CARRIER

John Guythar Bradford, 47 Mansfield Dr., Ancaster, Ontario, Canada

Filed May 29, 1973, Ser. No. 364,320
Int. Cl. A61g 1/02; A45f 1/00
U.S. Cl. 5—82 **1 Claim**



1. A collapsible and portable casualty carrier comprising a rectangular frame having two end frame members and two side frame members engageable with the end frame members and a bed portion in the form of a flexible sheet supported by the frame with longitudinal spaces between the side edges of the bed portion and the two side frame members, the bed portion being fixed to the side frame members by means of straps extending across between the side frame members, each of said side frame members comprising three rigid tubular sections, the end of one tubular section being foldably connected to the end of the next adjacent tubular section by means of a hinge joint, each hinge joint comprises a pair of solid cylindrical members fitted within adjacent ends of said tubular side frame members, each cylindrical member having a pair of projecting opposed ears forming a slot therebetween, with the pair of cylindrical members being pivotally joined by means of a plate mounted within the slots and pivotally connected to each pair of opposed ears, a rigid tubular locking sleeve slidably mounted on one of said tubular sections adjacent said hinge joint, said sleeve being slidable between a folding position entirely on said one tubular section and a locking position surrounding the hinge joint whereby the two tubular sections are locked in rigid end to end relationship and a resilient O-ring mounted in an annular recess adjacent said hinge joint, said O-ring being positioned to frictionally engage the sleeve while it is being moved between folding and locking positions and to just clear an end of the sleeve in folding or locking position thereby positively retaining the sleeve in either folding or locking position.

3,886,607
PLAY CRIB

Troy Dunn, 3445 Ocean View Blvd., San Diego, Calif. 92113

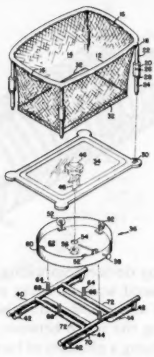
Continuation-in-part of Ser. No. 351,234, April 16, 1973, abandoned. This application Oct. 9, 1973, Ser. No. 404,210
Int. Cl. A47d 9/00
U.S. Cl. 5—104 **5 Claims**

1. A baby crib assembly comprising:

a body portion having a generally planar base with a continuous enclosure means upstanding from the outer margins thereof;

a stand assembly;

a rotatable means upon which the body portion is mounted, said body portion being vertically axled on said rotatable means and said rotatable means includes bearing means supporting said base;



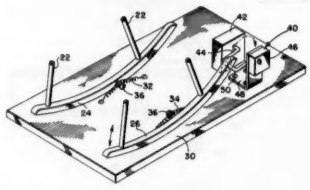
spring means positioned between the rotatable means and the stand assembly whereby manual force may cause the body portion to both rotate horizontally and simultaneously oscillate vertically; and

means mounted on said crib assembly to lock said body portion against rotation relative to said rotatable means.

3,886,608
ROCKING CHAIR OR CRADLE WITH ROCKING MECHANISM

Michael D. Casella, 248 E. 151 St., Cleveland, Ohio 44110

Division of Ser. No. 302,278, Oct. 30, 1972, Pat. No. 3,818,517. This application Jan. 30, 1974, Ser. No. 437,898
Int. Cl. A47d 9/02
U.S. Cl. 5—109 **5 Claims**



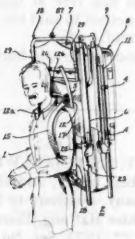
1. A rocker comprising a support member, rocker bars rigidly secured to and spaced from said support member for providing rocking motion, a base, means operatively connecting said rocker bars to said base to permit controlled rocking movement of said rocker on said base, and automatic rocking means operatively associated with at least one of said rocker bars for rocking the same, said automatic rocking means comprising an electric motor, and a crank rotatably driven by said motor, said crank being engageable with the adjacently disposed rocker bar for lifting the same for a relatively limited period in the rotational cycle of said crank, the relative positions of said crank and said adjacently disposed rocker bar and the path of rotational movement of said crank being such that said crank is out of the plane of said one rocker bar for the major portion of its rotational cycle, said one rocker bar being free to rock by itself when out of contact with said crank.

3,886,609

LIGHTWEIGHT TRANSPORTABLE TENT COT

Albert H. MacKenzie, 1632 E. Claremont, Phoenix, Ariz. 85016

Filed May 16, 1974, Ser. No. 470,347
Int. Cl. E03d *13/00*
U.S. Cl. 5—110 10 Claims



1. A self contained transportable shelter unit for hikers, said unit comprising in combination:

A. a foldable cot for providing off-the-ground support for the hiker, said cot having a first folded position and a second extended position and including:

1. a first and second head frame disposed at opposite ends of said cot, said first head frame including at least one transverse rod extending horizontally across said first head frame and means for vertically repositioning said transverse rod with respect to said first head frame;
2. a pair of articulated spaced apart rails extending intermediate said first and second head frames, said rails in combination with said first and second head frames defining the perimeter of said cot;
3. each said rail including joined pairs of telescoping members, for reducing the length of said rails when said cot is in said first position, said pairs of telescoping members being positionalbe adjacent one another when said cot is in said first position and positionable in axial alignment with one another when said cot is in said second position;
4. pivot means disposed at each junction of each of said rails and the corresponding one of said first and second head frames to permit said rails to pivot with respect to said first and second head frames;
5. further pivot means disposed at the junction of said pairs of telescoping members of each said rail to accommodate the articulation of said pairs of telescoping members;
6. a center support secured to said further pivot means for supporting said pair of rails; and
7. a foldable canvas support disposed intermediate to and supported by said first and second head frames and said pair of rails;

B. a foldable tent for sheltering the hiker, said tent being disposed upon said canvas support and extending intermediate said first and second head frames, said tent including resilient means interconnecting said tent with each of said first and second head frames for maintaining said tent upon said cot;

C. a form fitting backpack frame for mounting said cot upon the hiker's back, said form fitting backpack frame including a pair of vertical supports, releasable connection means engaging said vertical supports and said transverse rod for securing said form fitting backpack frame to said first head frame, whereby said form fitting backpack frame may be repositioned in the vertical axis with respect to said first head frame; and

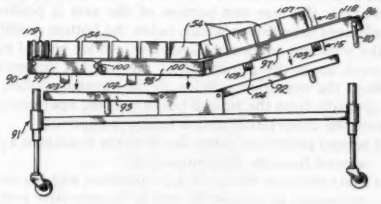
D. a knapsack for carrying the provisions of the hiker, attachment means extending from said knapsack for supporting said knapsack on said second head frame; whereby, said cot is foldable to said first position by articulating said rails to draw said first and second head frames and said attached knapsack toward said first head frame while foldably storing said canvas support and said tent intermediate said drawn together first and second frames to compress said unit and permit the hiker to carry said unit, and, whereby, said cot is extended to said second position by positioning said first and second head frames in a spaced apart relationship to axially extend and align said pairs of telescoping members to form said cot and extend said tent while retaining said knapsack off the ground by said second head frame.

3,886,610

HOSPITAL BED

Charles Hunter Shelden, San Marino, Calif., assignor to Huntington Institute of Applied Medical Research, Pasadena, Calif.

Continuation-in-part of Ser. No. 171,702, Aug. 13, 1971, abandoned. This application July 11, 1973, Ser. No. 383,298
Int. Cl. A61g *7/02, 7/10*
U.S. Cl. 5—81 R 16 Claims



1. A bed, comprising:

a bed frame having a foot end and a head end, the frame being hinged so the head end can be raised to elevate a patient's upper body;

mattress means for supporting a patient on the bed frame;

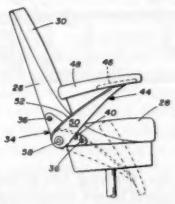
drive means on the frame and engaged with the mattress means for moving the mattress means longitudinally toward the head end of the bed and along an upwardly sloping portion of the frame adjacent the head end when the head end is elevated, whereby a patient who has slipped downwardly toward the foot end can be moved back toward the head end and along the upwardly sloping frame portion by moving the mattress means.

3,886,611

PIVOTABLE ARM REST FOR BOAT SEAT

James E. Lammy, Napoleon; Thomas Francis, Russia, and Lawrence E. Canter, Bryan, all of Ohio, assignors to Scott Port-A-Fold, Inc., Archbold, Ohio

Filed Aug. 2, 1973, Ser. No. 385,047
Int. Cl. B63b *29/00*
U.S. Cl. 9—7 3 Claims



1. In combination:

a fishing boat including:

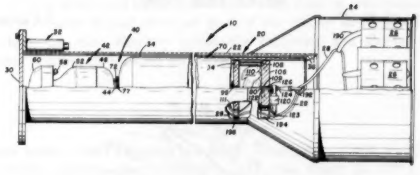
a relatively long, relatively narrow hull;
drive means for propelling the hull at relatively high speeds; and
an operating compartment including means facilitating steering of the boat and controlling the operation of the drive means;
a fishing seat supported on the hull of the fishing boat and including:
a substantially rigid seat shell;
a generally horizontally disposed bottom cushion mounted on the shell; and
a generally vertically disposed back cushion mounted on the shell;
a pivotable arm rest for the boat seat including:
a bracket secured to the boat shell and having at least one projection extending horizontally therefrom;
an arm pivotally supported on the projection of the bracket and extending therefrom to an arm rest portion; and
cooperating means on the arm and the bracket for selectively securing the arm either in an operative position wherein the arm rest portion of the arm extends outwardly from the back cushion and substantially above the bottom cushion of the boat seat and a stowed position wherein the arm rest portion of the arm is positioned adjacent to and substantially below the bottom cushion of the boat seat and for releasing the arm for pivotal movement about the projection of the bracket downwardly from the operative position to the stowed position and upwardly from the stowed position to the operative position the cooperating means further comprising:
a second projection extending from the bracket at a point spaced from the first projection;
a first surface on the arm for cooperation with the second projection to support the arm in the operative position; a second surface on the arm for cooperation with the second projection to support the arm in the stowed position; and
a knob threadedly engaging the first projection for cooperation therewith to alternately secure the arm either in the operative position or in the stowed position, and to release the arm for pivotal movement between the two positions.

3,886,612

MAN OVERBOARD PACKAGE

David R. Schnirel, Oxon Hill; William T. Zimmerman, White Plains; Birger E. Barsell, Indian Head, and Charles M. Christensen, Camp Springs, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 29, 1974, Ser. No. 501,530
Int. Cl. B63c *9/26*
U.S. Cl. 9—14 **18 Claims**



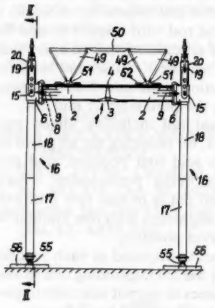
1. Apparatus for carrying life-saving equipment from a launcher to a selected target comprising:
a rocket motor;
a container open at one end and closed at another end;
said container connected to said rocket motor at said another end;
life-saving equipment housed within said container;
anchoring means between said life saving equipment and said open end, said anchoring means being attached to said lifesaving equipment;
means for urging said life-saving equipment out of said container;
releasable means for holding said life-saving means in said container;
a length of buoyant line free at one end stored in said launcher and connected to said life-saving equipment at the other end thereof; and
life saving rings connected to said buoyant line at intervals therealong.

3,886,613

HINGE SUPPORT, ESPECIALLY FOR A BRIDGE

Johannes Busch; Herbert Roser, and Hugo Sedlacek, all of Rheinhausen, Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Dec. 27, 1973, Ser. No. 428,870
Claims priority, application Germany, Jan. 8, 1973, 2300673
Int. Cl. E01d *19/00*
U.S. Cl. 14—14 **15 Claims**

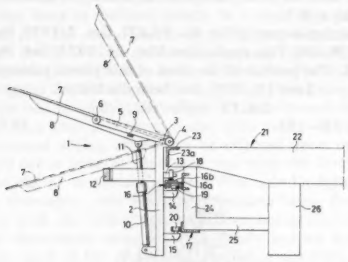


1. A support for a bridge which has a roadway framework, said support comprising:
two columns at each side of said framework;
a tie beam extending between said columns in the lateral direction of said framework, said tie beam being supported by said columns and supporting said framework which is fixed to said tie beam;
two head members engaging the ends of said tie beam in load transmitting relation in such a manner that independently of one another they can freely rotate relative to said tie beam about an axis extending in the lateral direction of said framework, and means for arresting said head members in angular positions relative to said tie beam;
guide members guided along said columns;
adjusting means on each said column engaging the respective guide member for adjusting it upwards and downwards along the respective column;
each said guide member being pivoted to one of said head members so that it can freely swivel relative to the head member about an axis which extends transversely to the longitudinal axis of said tie beam.

3,886,614
LOADING YARD WITH WHARVES

Knut Tage Lennart Rosengren, Eriksfaltsgatan 16, S-214 32 Malmo, Sweden

Filed Jan. 10, 1974, Ser. No. 432,201
Int. Cl. B65g *11/00*
U.S. Cl. 14—71 6 Claims

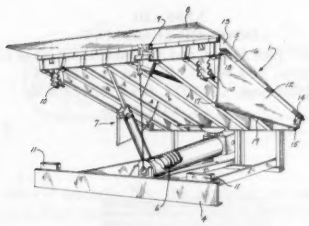


1. A loading yard provided with wharves wherein the front side of the loading yard has supporting and guiding rails extending horizontally along said front side to define journals and said wharf has rollers contacting said journals so that said wharf is suspended for movement along said loading yard, the improvement consisting in that a longitudinal member is mounted at said front side of said loading yard above said rails substantially along the length thereof, said longitudinal member extending from said front side forwardly at least approximately up to a vertical plane passing through the outermost edge of said rails and constituting a stop edge to prevent vehicles driven to the loading yard from ramming and deforming said rails.

3,886,615
TOE GUARD FOR A DOCKBOARD

Robert D. Metro, Brookfield, Wis., assignor to Kelley Company, Inc., Milwaukee, Wis.

Filed July 8, 1974, Ser. No. 486,413
Int. Cl. B65g *11/00*
U.S. Cl. 14—71 15 Claims

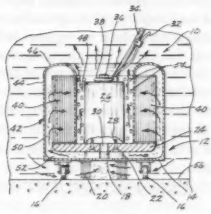


11. In combination, a loading dock having an upper loading surface and a forward vertical surface, said dock having a pit located at the junction of the upper surface and vertical surface, a dockboard mounted in the pit and including a supporting structure and a ramp structure hinged at its rear edge to the supporting structure and movable from a generally horizontal dock level position to an upwardly inclined position and to a downwardly inclined below dock level position, said ramp structure having a generally vertical side surface, a toe guard plate disposed generally flatwise to said side surface, pivotal means for pivotally mounting the rear end portion of the toe guard to one of said structures, first abutment means on said ramp structure, sedond abutment means on said plate disposed to be engaged by said first abutment means on upward elevation of said ramp structure, said first abutment means being spaced a substantial distance below the second abutment means when the ramp structure is at the horizontal dock level position, said first and second abutment means being arranged so that on initial upward movement of the ramp structure, the plate will not be moved upwardly with the ramp structure, and on continued upward movement of the ramp structure the first abutment means will engage the second abutment means to thereby pivot the plate upwardly with upward movement of the ramp structure, third abutment means on said plate, and stop means disposed to be engaged by said third abutment means as the ramp structure is lowered toward a dock level position, engagement of said third abutment means with said stop means preventing further downward movement of the plate and enabling the ramp structure to move to a below dock level position relative to said plate.

3,886,616
HAND PROPELLED SWIMMING POOL CLEANER

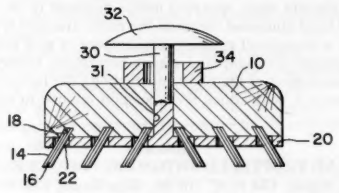
Fay A. Hayes, 144 N.W. 7th St., Boca Raton, Fla. 33432

Filed Dec. 6, 1972, Ser. No. 312,569
Int. Cl. E04h *3/20*
U.S. Cl. 15—1.7 4 Claims



1. A submergible swimming pool cleaner comprising,
a wheeled frame means,
a motor driven pump means on said frame means having a water intake means,
a filter means on said frame means in fluid communication with said water intake means for trapping water-borne particles in the water passing therethrough,
an elongated handle means operatively connected to said frame means extending upwardly therefrom to permit a person at poolside to manually move the cleaner along the bottom of the pool,
said frame means comprising a bottom portion spaced above the floor of the pool, a cylindrical housing extending upwardly from said bottom portion and having upstanding spaced apart outer and inner wall portions, said housing having a top portion extending over the upper ends of its said inner and outer wall portions, said filter means being cylindrical in shape and positioned in said housing between said inner and outer wall portions thereof, said filter means having an outer wall portion, said filter means having a diameter less than said housing so that the outer wall portion of said filter means is spaced inwardly of said outer wall portion of said housing to define an enclosed compartment area therebetween, said filter means having an inner wall portion positioned adjacent the inner wall portion of said housing, said inner wall portion of said housing having a plurality of discharge openings formed therein in communication with said filter means in said compartment area, said water intake means being an intake port formed in said bottom portion, said water intake means being in fluid communication with said compartment area so that the water will be drawn inwardly through said intake port by said pump means into said compartment area thence through said filter means and outwardly through said discharge openings.

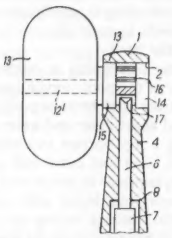
3,886,617
SELF CLEANABLE HAIR BRUSH
Garrie Labran, 1535 Pensacola St., Apt. 81, Honolulu, Hawaii 96822, and Thomas A. Chabrak, 185 Greenbrook Rd., Greenbrook, N.J. 08812
Filed May 28, 1974, Ser. No. 473,752
Int. Cl. A46b 17/06
U.S. Cl. 15—169 3 Claims



1. In a hair brush with means to remove entwined hair comprising a brush body having a plurality of tufts of bristles, a moveable plate having a principal plane parallel to the brush body, the plate having orifices through which the tufts pass, and means for moving the plate along the tufts to disengage hair entwined about the tufts, the improvement wherein:

Said tufts of bristles are rooted at an angle relative to the plane of the moveable plate, said plate having orifices through which the tufts pass whereby when the plate is moved away from the brush body the tufts are bent to a position substantially perpendicular to the plane of said moveable plate.

3,886,618
SWIVELLING TOOTHBRUSH
Xavier Paoletti, Le Pigonnet, Rue Roumanille, Aixen Provence, France
Filed Jan. 8, 1973, Ser. No. 322,004
Int. Cl. A46b 9/10
U.S. Cl. 15—172 2 Claims



1. A swivel tooth brush comprising:

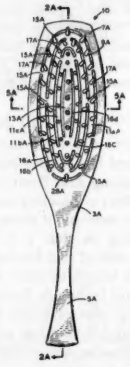
an elongated handle provided with a transverse bore forming a smooth bearing surface adjacent one end and a longitudinal bore terminating in said transverse bore,

shaft means within the bearing including a pair of axially spaced readially enlarged shaft portions and an intermediate gear-like member of smaller diameter than the shaft portions, said shaft portion being closely fitted to the smooth bearing to protect the member against dirt or external effects,

a spring biased locking-pin within the longitudinal bore having a wedge-shaped end normally located between a pair of teeth on the gear-like member for locking said shaft means in selected positions,

and a brush mounted on one end of the shaft means extending from the transverse bore, said brush being oblique relative to the axis of said shaft means.

3,886,619
DEFLECTING HAIRBRUSH
Solomon Natman, Brooklyn, and Robert A. Cohen, Kew Gardens, both of N.Y., assignors to Stance Industries Inc., Brooklyn, N.Y.
Continuation-in-part of Ser. No. 95,477, Dec. 7, 1970, Pat. No. 3,739,419. This application Mar. 26, 1973, Ser. No. 344,612. The portion of the term of this patent subsequent to June 19, 1990, has been disclaimed.
Int. Cl. A46b 1/00, 5/00
U.S. Cl. 15—187 16 Claims



1. A hairbrush comprising:

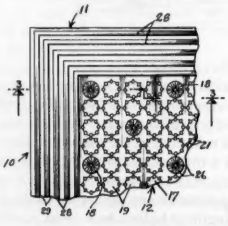
a plurality of flexible concentric rings separated by annular openings;

stiff teeth mounted on said concentric rings; and

flexible hinges bridging said openings flexibly connecting adjacent concentric rings;

said flexible concentric rings and flexible hinges causing said concentric rings to deflect away from the direction of brushing when said stiff teeth engage snags in the hair.

3,886,620
DOOR OR SHOE MAT
Harold Miller; Jack Miller, and Michael Miller, all of c/o Milco Plastics Corp., 100 8th St., Passaic, N.J. 07055
Filed Sept. 17, 1971, Ser. No. 181,436
Int. Cl. A47i 23/26
U.S. Cl. 15—217 7 Claims



1. A door mat comprising a molded one-composite material having a bottom base portion with top and bottom surfaces, flexible projections being integrally formed with the top surface of the base and extending upwardly therefrom with which wiping action can be effected upon the bottom of a shoe sole,

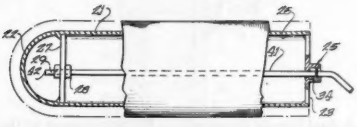
annularly inter-connecting base ridges extending upwardly from and integral with each of adjacent flexible projections providable of upright reinforcement support such that said projections are substantially rigidly self-supporting but adapted to be flexed under the weight of a foot-worn shoe; upstanding non-flexible scraper-projections with an upper top surface having a plurality of upwardly directed separate scraper sharp edges integrally fused laterally to one another such that hard or fastened debris on a shoe sole is readily scraped by the non-flexible projections being dispersed through the flexible projections and rising upwardly to less than the height of the free and extended flexible projections and adapted for full weight of a foot-worn shoe being placed opon the mat to support the weight of the foot-worn shoe and at the same time providing means upon which heavier and concentrated wiping action can be effected upon the more adhered debris upon the shoe sole and while the flexible projections still lie in contact with the shoe sole for light wiping action thereupon, said flexible projections being formed in clusters with the individual projections being circularly arranged thereabout and circumferentially spaced from one another, each of the projections extending upwardly from a common base and being of tapering section and having its ends overlying a plane extending between the surface of the upper ends of the non-flexible projections, the diameter of the clusters being generally the same diameter as the non-flexible projections, the clusters and the non-flexible projections being spaced from one another to support a foot sole under its full weight without depressing the flexible projections below the plane extending across the top surface of the non-flexible projections, and in which the plurality of scraper sharp edges of the non-flexible projections are formed as ridges with notches alternately angularly spaced between adjacent ridges of said non-flexible projections upper top surfaces and the plurality of notches and ridges extending radially outwardly from the center of the top surface of the rigid projections and being formed as part of the rigid projections providing thereby sharp rigid scraping edges.

3,886,621

PAINT ROLLER AND HANDLE THEREFOR

Homer Ernest Welsh, Rt. 1, Box 186, Talbott, Tenn. 37877

Filed Jan. 22, 1974, Ser. No. 435,444
Int. Cl. B44d *3/28*
U.S. Cl. 15—230.11 **1 Claim**



1. A device intended for the applying of paint simultaneously to a face surface of one siding member and an adjacent bottom overlapping edge of an adjacent top siding member, said device comprising:

a roller of an elongated cylindrical shape having cylindrical side wall surfaces, a curved closed outer end, and a closed inner end, said side wall surfaces and end surfaces defining a bore interiorly thereof, said cylindrical side wall surfaces and said curved end surface provided with a nap of material adapted to hold paint for applying the same to a surface to be painted;

a handle member including an elongated cylindrically shaped rod like axle adapted to be received axially in said bore of said roller for said roller to rotate thereabout;

a support member disposed in said roller bore intermediate the interior surfaces of said cylindrical wall surfaces and adjacent said curved end, said support member provided with a bushing centrally thereof;

said bushing having an axial bore extending therethrough and disposed concentric with the axis of said roller;

said closed end of said roller having an opening disposed centrally thereof and extending axially therethrough in alignment with said bushing bore;

a collar member disposed concentric with said closed end opening and projecting axially outwardly from said closed end, said collar member having a bore extending therethrough disposed in substantial alignment with said closed end opening such that said axle is adapted to be rotatably supported in said aligned closed end opening and said bushing bore with said collar member detachably retaining said axle to said roller to permit rotation of said roller about said axle in opposite directions; and

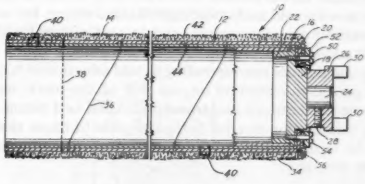
said collar member comprises an elongated cylindrical open ended body member having cylindrical side walls, a back end affixed to said roller closed end, and a front end projecting outwardly therefrom, a plurality of circumferally spaced slots disposed in said side walls opening out of said front end and extending longitudinally through said side walls to a position short of said back end thereof, said collar member being manufactured of a resilient material, said slots dividing said collar member side wall surfaces into a plurality of sections, each of said sections provided on the interior surface thereof with a radially inwardly directed projection, each projection terminating in an apex portion spaced apart from the other apex portions of the other projections, the apex portions defining a circle having a diameter less than the diameter of said collar member bore and also less than the diameter of said axle, and said axle provided with an annular groove therein adapted to be engaged by said apex portions when said axle is in supported position in said roller bore with said axle terminal end rotatably supported in said bushing bore whereby the roller is detachably attached to the axle in a rotatable manner relative thereto.

3,886,622

TUBULAR BUFFER ELEMENT

Thomas A. Horst, Lafayette, Colo., assignor to Western Sales and Supply Co., Denver, Colo.

Filed Jan. 26, 1973, Ser. No. 326,762
Int. Cl. A47l *11/40*
U.S. Cl. 15—230.13 **1 Claim**

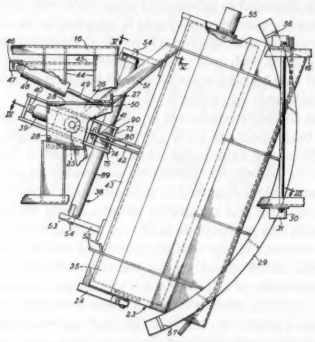


1. The replaceable buffer element for rotating drum-type buffers which comprises: an elongate rigid tubular core sized to fit over the drum; a strip of carpeting wound in spiral fashion onto the core so as to define a helical butt joint between adjacent convolutions; means for attaching the carpeting strip to the core comprising circumferentially stitched seams adjacent each end, said seams each being essentially coplanar and the planes defined thereby lying in substantially normal relation to the core axis, and a sawtooth edge formed in at least one end, said sawtooth edge defining a ring of bendable teeth foldable inwardly into essentially coplanar relation.

3,886,623
VACUUM TYPE SWEEPER

Eric Landesman, Aurora, and Donald R. Palmiter, Elgin, both of Ill., assignors to Elgin Sweeper Company, Elgin, Ill.

Filed July 14, 1972, Ser. No. 271,684
Int. Cl. A47l 5/00
U.S. Cl. 15—319 12 Claims



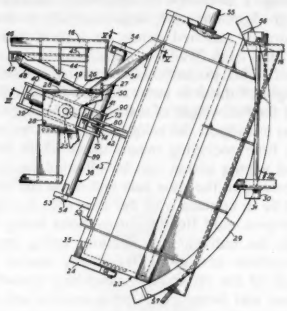
3. A vacuum type sweeper comprising: a truck having a frame and a transmission shiftable between forward and reverse; a pair of side brooms mounted on opposite sides of said truck; side broom control means operable to move said side brooms between sweeping and transport positions; a rotatable cylindrical extension broom; mounting means mounting said extension broom beneath said truck, said mounting means including means for pivoting said extension broom between selected positions where it is cooperable in sweeping toward said side brooms; a pair of suction nozzles mounted on opposite sides of said truck adjacent said side brooms; means for moving said suction nozzles between sweeping and transport positions; a debris container carried by said truck in communication with said suction nozzles; a pair of gate valves disposed between respective ones of said nozzles and said debris container and means for selectively operating said gate valves to interrupt the communication thereof; additional devices in corresponding pairs mounted on opposite sides of said truck and means for operating said devices to perform other street cleaning functions; means operable to store a selection of street cleaning functions connected to said side broom control means, to said extension broom pivoting means, to said means for moving said suction nozzles, to said means for selectively operating said gate valves, and to said means for operating said additional operating devices, and a single switch for causing said devices corresponding to said selection of functions to be placed in operation on one side of the truck; and means connected between said transmission and said means for moving said suction nozzles being operable to cause said nozzles to be raised automatically upon shifting of said transmission into reverse.

3,886,624
VACUUM TYPE SWEEPER

Eric Landesman, Aurora, and Donald R. Palmiter, Elgin, both of Ill., assignors to Elgin Sweeper Company, Elgin, Ill.

Division of Ser. No. 271,684, July 14, 1972. This application July 31, 1973, Ser. No. 384,236
Int. Cl. A47l 9/00
U.S. Cl. 15—340 12 Claims

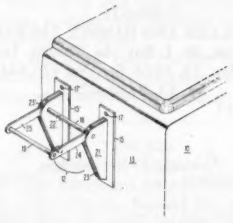
1. A vacuum type sweeper of the type having dual side brooms mounted on opposite sides of a sweeper truck, a cylindrical rotating extension broom mounted beneath the sweeper truck and pivotable between positions wherein it is effective to sweep toward the side brooms, two transversely spaced vacuum sweepings pickups mounted on said frame immediately rearward of said extension broom, said extension broom when pivoted in one position, being operable to sweep into one of said vacuum sweepings pickups and when its other position being operable to sweep into the other of said vacuum sweepings pickups, means for selectively moving either vacuum sweepings pickup from a road travel position to a sweepings pickup position, and means for preventing uneven wear of said extension broom including means for maintaining the axis of rotation of said extension parallel to the surface being swept.



3,886,625
DUAL HANDLE CONSTRUCTION FOR CASKETS

Ernest J. Rollband, 3415 Slaterville R.D. No. 1, Brooktondale, N.Y. 14817

Filed July 5, 1974, Ser. No. 485,838
Int. Cl. A47b 95/02
U.S. Cl. 16—112 3 Claims



1. A dual handle construction for attachment to the wall of a casket comprising a first, fixed bar member extending at a given distance from the wall of the casket and parallel thereto, support means for said member attached to the wall of the casket, a second bar member adapted to extend from said wall at a greater distance than said first bar member and parallel thereto, a pair of arms attached to said second bar member, said arms being pivotally mounted for swinging said second bar member into active position when in use and into inactive position against the casket wall when not in use.

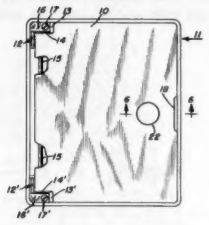
3,886,626
HINGE MECHANISM

Stephen G. Fogle, Mountain Lakes, N.J., assignor to Q.V.S., Inc., East Orange, N.J.

Filed Nov. 28, 1973, Ser. No. 419,681
Int. Cl. E05f 1/12
U.S. Cl. 16—184 5 Claims

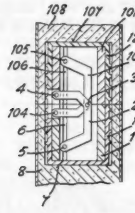
1. A hinge mechanism securing a panel to a case and comprising,

a. a pair of fixed supports positioned at two internal, adjacent corners of the case, said supports having flat surfaces lying in a plane spaced from and substantially parallel to the plane of the base of the case,
b. a shaft rotatably carried by the panel along one edge thereof, said shaft having end portions supported on the said flat surfaces and said shaft having a diameter less than the length of the flat surfaces taken in a direction normal to the shaft axis,



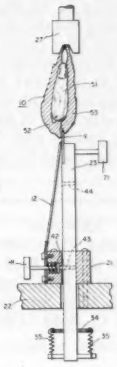
c. means limiting lateral displacement of the shaft in a direction away from the said flat surface,
d. spring means disposed between an inner wall of the case and the said one edge of the panel, said spring means normally applying pressure to the panel in a direction away from the said inner wall of the case, and
e. latching means disposed at the opposite inner wall of the case for securing the panel in a plane substantially parallel to that of the base of the case.

3,886,627
LINK HINGE
Eraclio Bassan, 91 e, Viale Porta Adige, Rovigo, Italy (45100)
Filed May 22, 1973, Ser. No. 362,670
Claims priority, application Italy, May 30, 1972, 12693/72
Int. Cl. E05d *3/06*
U.S. Cl. 16—163 **4 Claims**



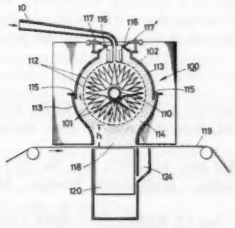
1. In a link hinge for connecting two elements, the link hinge including a pair of hollow, substantially tubular shells hingedly interconnected at one end of each shell by link means normally housed inside said tubular shells, the improvement comprising a pair of thin walled cylindrical boxes into which said tubular shells are inserted, with each said box and its corresponding shell being substantially longitudinally coextensive, and with means in the form of at least one flattened surface formed at one side of each shell cooperating with a corresponding profile formed in each box for coupling the shells to the boxes in a non-rotatable manner, said boxes being received within respective ones of the elements to be connected.

3,886,628
OYSTER SHUCKER AND METHOD
Robert J. Berry, Lake Hiawatha, N.J., assignor to Lawrence J. Maher, Lake Hiawatha, N.J., a part interest
Filed Jan. 11, 1974, Ser. No. 432,747
Int. Cl. A22c *29/00*
U.S. Cl. 17—76 **24 Claims**



1. An oyster shucker, comprising: a pair of knife blades, a first blade of said pair being adapted to sever the hinge of an intact oyster shell, the second blade of said pair being adapted to scrape an oyster away from one inner wall of a severed-hinge oyster shell; and movable compressive force means for compressively forcing an oyster shell upon said pair of knife blades; said movable compressive force means being positioned with respect to said pair of blades and said oyster shell so as to force both of said blades to engage and enter said oyster shell and cause said first blade to sever the hinge of said shell and said second blade to scrape said oyster away from said inner wall, upon movement of said compressive force means toward said pair of blades.

3,886,629
APPARATUS FOR PRODUCING FIBROUS MATS
Susumu Nakai, Tokyo, and Hisashi Matsumura, Fujinomiya, both of Japan, assignors to Honshu Paper Company, Ltd., Tokyo, Japan
Filed Apr. 7, 1972, Ser. No. 242,060
Claims priority, application Japan, Sept. 10, 1971, 46-69672
Int. Cl. D01g *25/00*
U.S. Cl. 19—156.3 **9 Claims**



1. Apparatus for producing fibrous mats which comprises: an elongate cylindrical separating wall having sifting openings uniformly distributed over substantially its entire circumferential areas except a full width inlet portion through which untreated fibers are fed; a rotary shaft; a dispersing means mounted on said shaft for rotation therewith and operatively associated with said separating wall for dispersing fiber flocks

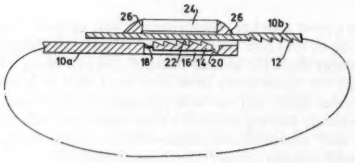
into elementary fibers; a casing disposed in surrounding relation to said separating wall and defining therewith an annular dispersing chamber having a downwardly directed fiber outlet for dispersed fibers, said casing being provided with full width air intake openings at the upper end thereof and, said casing being further provided in opposite sides thereof with an elongate aperture communicating with the atmosphere for introducing a controlled volume of air into said chamber, said chamber between the casing and the separating wall widening progressively towards said fiber outlet so as to maintain a constant velocity of air throughout all regions of said chamber; a damper provided at the upper end of said dispersing chamber in operative association with said air intake openings for regulating the volumertic ratio of air to fibers within said chamber; and a moving endless wire conveyor and suction means underlying said fiber outlet for the deposition thereon of dispersed fibers.

3,886,630

CABLE TIE CLIPS

Edgar Frank Emery, Isle of Man, England, assignor to Manx Mail Order Limited, Isle of Man, England

Filed July 15, 1974, Ser. No. 488,420
Int. Cl. B65d *63/00*
U.S. Cl. 24—16 PB **3 Claims**



1. A tie device comprising an elongate strip which is transversely serrated on one surface over at least part of the length of the strip towards one end thereof and has a pawl disposed within an opening at the other end thereof and joined, at opposite ends, to the main body of the strip by flexible webs integral with such body and with said pawl, said pawl being transversely serrated on the surface therof corresponding to said one surface at the other end of the strip, said strip further being formed with a quideway extending over said opening and pawl to receive the serrated end of the strip, said webs permitting yielding movement of said pawl to allow the serrated end of the strip to pass into the guideway and the serrations thereon to engage with the serrations on said pawl, and said serrations being so shaped that movement of the serrated end of the strip in a direction to withdraw such end from said quideway results in a jamming together of the pawl and serrated strip end within the confines of said quideway thereby resisting withdrawal of said end from the guideway.

3,886,631

SELF-CLAMPING GRIP FOR A FREE CABLE WINCH

Patrice Caradot, Saint-Etienne, France, assignor to Milbras, France

Filed Dec. 14, 1972, Ser. No. 315,110
Claims priority, application France, Dec. 15, 1971, 71.46247
Int. Cl. F16g *11/00;* **B66f** *3/00*
U.S. Cl. 24—134 N **10 Claims**

1. A gripping apparatus for a free cable winch, comprising, in combination:

a first jaw member;

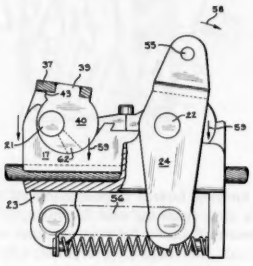
a second jaw member disposed adjacent said first jaw member to form with said first jaw member a passageway through which a cable may selectively be pulled and clamped;

substantially round eccentric push means bearing directly against and mating with said first jaw member;

first strap means embracing one end of said first and second jaw members;

second strap means embracing the other end of said first and second jaw members;

first pivot means disposed on one side of said cable passageway, said first pivot means extending through apertures having completely closed peripheries provided in said strap means, in said second jaw member, and in said eccentric push means to pivotally interconnect said first and second strap means, respectively, and said eccentric push means with said second jaw member;



link means;

second pivot means disposed on the other side of said cable pivotally interconnecting said link means and said first and second strap means; and

resilient means connected between said second jaw member and said first strap means urging said jaw members to clamp together against said cable under the action of said eccentric push means, and

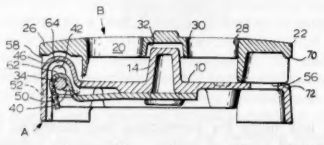
wherein each of said strap means has a transverse bottom, the inner surface of which is provided with an aperture adapted to receive one of said eccentric push means.

3,886,632

BUCKLE

Lazlo Bako, Woodcliff Lake, N.J., assignor to Presto Lock Company, Division of Walter Kidde & Company, Inc., Elmwood Park, N.J.

Filed Jan. 30, 1974, Ser. No. 437,932
Int. Cl. A44b *11/22*
U.S. Cl. 24—167 **10 Claims**

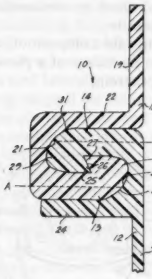


1. A buckle for use with a perforated strap comprising a base plate having a stud projecting therefrom for receiving a selected perforation of the strap, a loop member pivotally attached to the base plate and movable to lowered and raised positions relative to the base plate, and tang means formed integrally with the loop member and extending into the opening defined by the loop member, the tang means covering the end of the stud when the loop member is in the lowered position for maintaining the selected perforation of the strap in receiving engagement with the stud.

3,886,633
INTERLOCKING FASTENER WITH INCREASED RESISTANCE TO SEPARATION

Steven Ausnit, Rt. 303, Orangeburg, N.Y. 10962

Filed Aug. 30, 1973, Ser. No. 392,882
Int. Cl. A44b 17/00
U.S. Cl. 24—201 C 4 Claims



1. In a separably releasable fastener formed from resiliently yieldable material and comprising at least one inner head on a first fastener strip and a complementary outer head on a second fastener strip, each head having a back side and a hook tooth side at respectively opposite sides of a generally central axis extending through a crown area of the head, each head having on its hook tooth side a hook tooth portion provided with a hook surface extending generally laterally relative to the central axis of the head, the hook surfaces of the hook tooth portions being interlockingly engaged with one another, and the hook tooth portions under conditions of stress separating through distortion of said hook tooth portions until they release from one another, the improvement comprising:

a greater crown mass of material on the respective crown areas at the tooth portion side of the axis of each of the heads and generally aligned with the hook tooth portion at that side of the axis;

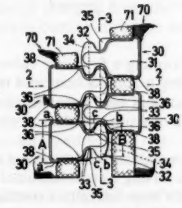
and the crown area of each head at the back side of the axis being of substantially less mass than the greater crown mass of material at the hook tooth side of the axis;

whereby resistance to separating distortion of the hook tooth portions of said heads is increased because of said greater crown mass of material, as compared with fastener heads having a generally uniform mass semicylindrical crown profile from the hook tooth sides to the back sides of the heads.

3,886,634
ZIP-FASTENER

Kiyoo Murata, Kyoto, Japan, assignor to New Japan Slide Fastener Mfg. Co., Ltd., Japan

Filed Nov. 27, 1973, Ser. No. 419,188
Int. Cl. A44f 19/04
U.S. Cl. 24—205.13 R 3 Claims

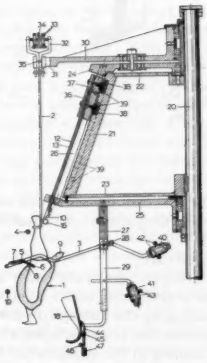


1. A zip-fastener comprising a pair of cloth tapes in an opposed relation, a pair of cloth stringers fixed along the two opposed edges of said cloth tapes, a plurality of interlocking members anchored on said stringers at regular intervals, and a slide piece to be pulled between said interlocking members to open and close the fastener; said interlocking members consisting of a head, a neck adjacent said head and a stem adjacent said neck, said head having two generally semicircular portions on opposed sides of the plane of the tape, said head and said neck having engaging means for interlocking with the necks and heads of adjacent opposed interlocking members when the fastener is closed, the terminal portion of the anchoring end of said stem being wider than the remaining portion of said stem and wider than said head, said remaining portion of said stem falling within imaginary lines drawn between the terminal portion of said anchoring end and the widest portion of said head, said intervals between two adjacent interlocking members being such that the adjacent terminal ends of their stems touch each other before their necks touch an adjacent head of an opposed interlocking member when the fastener is closed and flexed.

3,886,635
APPARATUS FOR DRAWING A FOWL

Pieter Meyn, Noordeinde 72, Oostzaan, Netherlands

Filed Nov. 13, 1973, Ser. No. 415,379
Claims priority, application Netherlands, Nov. 22, 1972, 7215768
Int. Cl. A22c 21/00
U.S. Cl. 17—11 13 Claims



1. Apparatus for drawing a fowl, comprising at least one movable supporting element, a hook in said supporting element for suspending a fowl by its ankle joints;

a drawing member formed as a linearly reciprocable bar having a pivotable extension provided with a wedge shaped slot for catching the fowl's gullet, and with a blunt outer end;

means for inserting said drawing member in a fowl through an opening made between its breatbone and its tail until the free end of the drawing member abuts on the fowl's ribs on both sides of its spine;

means for keeping said extension aligned with said bar during the insertion of said drawing member;

means for pivoting said extension towards the fowl's spine when said drawing member reaches its lowermost position, in such manner that said blunt outer end of said extension is pressed against the fowl's ribs;

a pressure member;

means for withdrawing said drawing member from the fowl along its ribs while pressing the fowl's back against said

pressure member and carrying along the fowl's entrails connected to its gullet;

means adapted to grip between the fowl's legs and hold the same during the insertion and the withdrawal of said drawing member; and

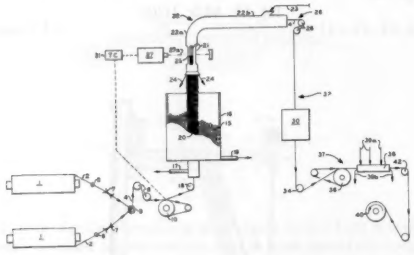
positioning means cooperating with said drawing member to bring the fowl's breatbone into the desired position relative to said drawing member during the insertion of said drawing member, and including a flap pivotably connected to said holding means, a counterweight normally holding said flap spaced from and over the tip of the fowl's breastbone, said flap being pressable down onto the said breastbone by said drawing member during its insertion against the action of said counterweight to bring the breastbone into the correct position, after which said flap serves to guide said drawing member into the fowl.

3,886,636

YARN PROCESSING

David E. Borenstein, and Richard C. Newton, both of Greenville, S.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 24, 1973, Ser. No. 363,480
Int. Cl. D02g *1/20*
U.S. Cl. 28—72.11 **7 Claims**



1. A method for processing yarn in one continuous operation without allowing the yarn to cool to ambient temperature comprising:

crimping a heated yarn;

entangling the crimped yarn while under low tension; and

heating the entangled yarn under a higher tension and thereafter packaging the entangled yarn while still warm and under tension thereby producing a straightened yarn which after cooling in the straightened form will assume a crimped form upon subsequent heating in a relaxed state.

3,886,637

METHOD OF PRODUCING HEAT TREATABLE TITANIUM CARBIDE TOOL STEEL COATINGS ON CYLINDERS OF INTERNAL COMBUSTION ENGINES

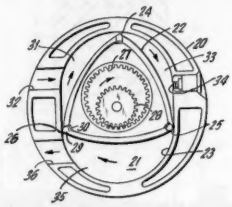
John L. Ellis, White Plains; M. Kumar Mal, Spring Valley, and Stuart E. Tarkan, Monsey, all of N.Y., assignors to Chromalloy American Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 199,497, Nov. 17, 1971, Pat. No. 3,779,720. This application Aug. 17, 1973, Ser. No. 389,212
Int. Cl. B21k *3/00*
U.S. Cl. 29—156.4 WL **5 Claims**

1. In a method of producing a hard, wear resistant metal coating on the wall of a piston-receiving chamber of a housing of an internal combustion engine cast from aluminum, wherein said coating metal is first deposited by a plasma flame upon a smooth surface of a core corresponding in configuration to the wall of said aluminum housing, the core being then inserted in a mold for casting said engine housing by causing molten aluminum to flow into said mold under pressure and surround said core in contact with said coating and solidify therein and wherein said core is thereafter removed from said cast housing with the coating transferred to the wall of said cast housing, the improvement which comprises,

selecting a powder composition containing about 10% to 80% by weight of primary grains of titanium carbide and the balance essentially about 90% to 20% by weight of steel-forming ingredients which when melted to form a steel and quenched from an austenitizing temperature tends to form martensite,

and quench-depositing said composition upon the smooth surface of said core by means of a plasma flame to form a coherent coating therein,



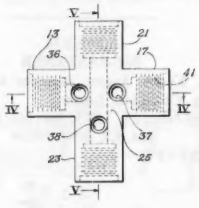
such that when said coherent coating of said titanium carbide tool steel composition is transferred to the wall of said housing by casting aluminum about said core and the core thereafter removed, the transferred coating is characterized by primary grains of titanium carbide uniformly dispered through a matrix containing an austenitic decomposition product selected from the group consisting of martensite, bainite and mixtures thereof and further characterized in that said coating is capable of being heat treated at a temperature below the melting point of said aluminum housing.

3,886,638

MULTI-WAY VALVE PORTING BLOCK

Dennis J. Hayman, Abilene, and Robert George Stultz, McKinney, both of Tex., assignors to Hydrometals, Inc., Dallas, Tex.

Filed June 15, 1973, Ser. No. 370,228
Int. Cl. B23p *15/00, 13/00*
U.S. Cl. 29—157.1 R **3 Claims**



1. A method of forming a four-way valve porting block for a mixing valve having a control head and respective conduits for, respectively, hot and cold water from a source and controlled water to one of a tub and shower comprising the steps of:

a. cutting off a predetermined thickness of a four-way metallic bar stock having a cross sectional shape in the form of a cross with two laterally extending arms and two aligned perpendicular arms extending normal to said laterally extending arms to form a solid cross shaped block with four respective arms;

b. forming by machining a first large bore in each of said four arms for conformingly and sealingly receiving respective large conduits carrying the respective waters;

c. forming by machining a first smaller bore extending longitudinally of said two perpendicular arms and communicating with the respective first large bores formed therewithin; one arm being adapted for connection with conduit leading to a shower and the other arm being adapted for connection with conduit leading to a tub;

d. forming by machining two smaller apertures extending laterally through one side wall of said cross shaped block and communicating, respectively, with each of said first large bores in said laterally extending arms; said smaller apertures being adapted for being connected with smaller conduits to the control head; and

e. forming an aspirating passageway extending through said side wall and in communication with said first large bore in said other arm, of said two perpendicular arms, for being installed pointing downwardly and connected with said conduit leading to said tub; said aspirating passageway being adapted for being connected with a smaller conduit from the control head and terminating in an aspirating aperture near the center of said first large bore of said other arm, said aspirating passageway being formed by drilling two intersecting third and fourth bores.

3,886,639

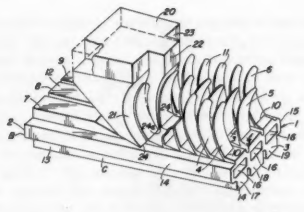
METHOD OF MAKING A FINNED HEAT EXCHANGER

Stephen F. Pasternak, Park Ridge, Ill., assignor to Peerless of America, Incorporated, Chicago, Ill.

Filed Feb. 1, 1975, Ser. No. 438,682. The portion of the term of this patent subsequent to July 17, 1990, has been disclaimed.

Int. Cl. B21d *53/02;* **B23p** *15/26*

U.S. Cl. 29—157.3 A **3 Claims**



1. The method of making heat transfer element, comprising

a. forming an elongated tubular member having a wall portion with spaced elongated external ribs extending longitudinally of said tubular member, and

b. successively, from one end portion of said tubular member toward the other end portion thereof,

1. cutting fins from a plurality of said ribs simultaneously, and by means of a cutting tool having cutting surfaces aligned with respective ones of said ribs and having alternate ones of said cutting surfaces being offset longitudinally of said ribs from the immediately transversely adjacent cutting surfaces, and

c. to thereby

1. afford

a'. elongated base portions

1'. extending across said ribs transversely to the length thereof and

2'. directly attached to said ribs, and

b'. free end portions projecting outwardly therefrom, and

2. dispose said free end portions of said fins in position wherein said free end portions of said fins on alternate ones of said rows are disposed a different distance from one end of said tubular member than the free end portions on immediately transversely adjacent fins in the other said rows.

3,886,640

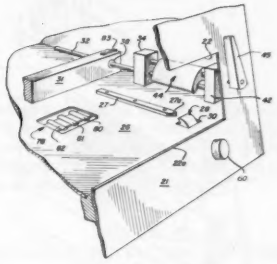
HOUSING FOR THE CONTROLLED EXPOSURE OF FILM CASSETTE

Jay S. Waxman, and Burton L. Siegal, both of Skokie, Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Nov. 23, 1973, Ser. No. 418,230

Int. Cl. B23p *19/00*

U.S. Cl. 29—200 P **15 Claims**



1. A housing for controlled exposure of a film cassette wherein the latter has a tray section, a cover section hingedly connected thereto, a releasable lock for retaining the cover section in a closed relation with respect to the tray section, and an elongated guideway formed in the underside of the tray section, said housing comprising a light-tight chamber having a wall provided with an opening through which a closed cassette is adapted to pass; a door mounted on said chamber wall for movement between either an open or closed position with respect to the chamber wall opening; a cassette-supporting base forming a surface of the chamber and provided with an elongated protruding guide means for being slidably disposed within the cassette guideway when the cassette is inserted into or removed from the chamber through the chamber wall opening, said guide means effecting release of the cassette lock when the cassette assumes a predetermined station within the housing chamber; means adjustably mounted within said chamber and adapted when actuated in one direction to effect opening of the cassette cover section to permit exposure of the film when the cassette has assumed said predetermined station, and when actuated in a second direction to effect closing of the cassette cover section; releasable means within said chamber for retaining a cassette at said predetermined station; and locking means movably mounted on said housing for retaining said door in a closed position when the cassette cover section is in an open position.

3,886,641

APPARATUS FOR INSERTING WIRES INTO TERMINALS IN AN ELECTRICAL CONNECTOR

John Douglas Davis, Lexington, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed June 14, 1974, Ser. No. 479,380

Int. Cl. H01r *43/04*

U.S. Cl. 29—203 MW **10 Claims**

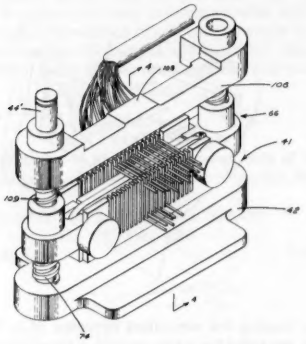
1. Apparatus for moving conductors laterally of their axes in opposite directions towards each other and into the conductor-receiving portions of electrical contact terminals which are contained in a multi-contact electrical connector, said conductor-receiving portions being arranged in two side-by-side parallel rows which are on oppositely facing surfaces of said connector, said apparatus comprising:

fixed and movable insertion tool means, each of said tool means having conductor insertion means for inserting said conductors into said conductor-receiving portions, said inser-

tion tool means being normally spaced apart with said conductor insertion means opposed to each other,

connector holding means normally disposed between said tool means, said holding means being adapted to hold said connector in an orientation with said conductor-receiving portions opposed to said insertion tool means,

guide means extending rectilinearly from said fixed insertion tool means to said movable insertion tool means, said movable insertion tool means and said connector holding means being in guiding engagement with said guide means, and



resilient means interposed between said fixed insertion tool means and said connector holding means and between said connector holding means and said movable insertion tool means whereby,

upon locating said conductors between said fixed insertion tool means and said connector holding means and between said connector holding means and said movable insertion tool means, and upon moving said movable insertion tool means towards said fixed insertion tool means, said movable insertion tool means moves said connector holding means towards said fixed insertion tool means and said conductor insertion means inserts said conductors into said conductor-receiving portions of said terminals.

3,886,642

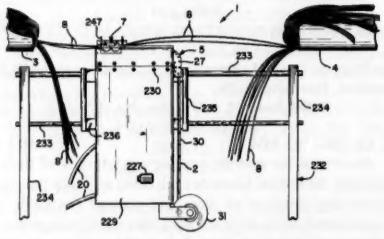
METHOD AND APPARATUS FOR CONNECTING WIRES

Dory J. Neale, Sr., Saint Petersburg, Fla., assignor to The National Telephone Supply Co., Cleveland, Ohio

Filed July 24, 1974, Ser. No. 491,288

Int. Cl. H01r *43/04*

U.S. Cl. 29—203 DT **21 Claims**



1. Apparatus for trimming the end portions of wires and crimping an open sided electrical connecting device onto the trimmed wire ends to splice same, said apparatus comprising:

a. a support member;

b. wire receiving members movably mounted relative to said support member and each adapted to grip a wire of a matched pair adjacent free ends of said wires;

c. cutting means on the support adjacent the wire receiving member when in a wire receiving position and operable to trim each wire free end to a predetermined point relative the respective wire receiving member;

d. means on the support defining a connector sleeve receiving position;

e. connector sleeve moving means moving and indexing an open sided connector sleeve to said connector sleeve receiving position;

f. crimping members mounted on the support and having portions relatively movable toward and away from each other at said connector sleeve receiving position for crimping a connector sleeve about wires therein to splice same;

g. actuator means on said support and operative to in sequence move the cutting means to trim the wires, move the wire receiving members to deposit the trimmed wire end portions in the connector sleeve and move the crimping member portions to crimp the wire end portions in the connector sleeve and electrically connect same, retract the crimping member portions to release the sleeve and connected wires.

3,886,643

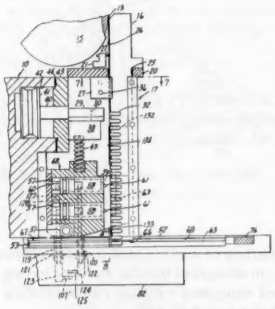
CLIPPING APPARATUS AND CLIPS THEREFOR

Karl A. Klenz, Oakland, and Clyde R. Velarde, Hayward, both of Calif., assignors to Rheem Manufacturing Company, New York, N.Y.

Division of Ser. No. 175,085, Aug. 26, 1971, Pat. No. 3,777,400. This application Apr. 26, 1973, Ser. No. 354,737

Int. Cl. B23p *11/00;* **B65b** *51/04*

U.S. Cl. 29—243.57 **2 Claims**



1. Clipping apparatus comprising:

an elongated planar strip of clip material formed with a plurality of equally spaced apart apertures along its length,

means for feeding said strip along a path of travel parallel to the longitudinal axis of said strip,

means alongside said path for forming said strip to a generally U-shape during said feeding to provide a central body portion and a pair of legs bent at substantially right angles thereto,

means for shearing an end portion of said strip to separate a clip, and

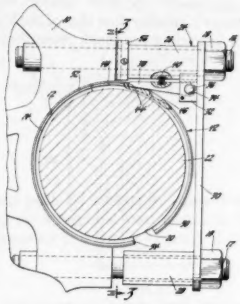
means for deforming said clip around a product,

said feeding means being interposed between said forming means and said shearing means,

said feeding means comprising a slide supported for movement parallel to said path, a pin carried by said slide, means carried by said slide for urging said pin in a direction perpendicular to said path and into one of said aper-

tures, and means carried by said slide for withdrawing said pin from such aperture.

3,886,644
UPPER MAIN BEARING REMOVAL TOOL
Julius F. Koch, Jr., River Forest, Ill., assignor to General Motors Corporation, Detroit, Mich.
Filed June 19, 1974, Ser. No. 480,935
Int. Cl. B25b *27/14*
U.S. Cl. 29—270 **2 Claims**



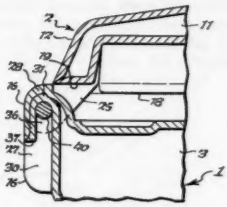
1. A main bearing removal device for use with an engine having a block with one or more arcuate bearing seats, a crankshaft having journal surfaces adjacent the bearing seats, an arcuate bearing shell in each bearing seat between the bearing seat and the crankshaft journal surface, a pair of stud bolts flanking each bearing seat and projecting from the block and a nut on each stud bolt, the device comprising in combination:

a reciprocable member mountable on one of the stud bolts between the nut and the engine block, the reciprocable member having a pawl pivotably mounted thereon, the pawl extending toward the main bearing seat when the reciprocable member is mounted on the one stud bolt, and being biased away from the one stud bolt;

an arcuate member substantially similar to the main bearing shell, the arcuate member having ratchet teeth cut in its outer surface, the arcuate member being effective when placed against the crankshaft bearing surface with one end abutting the end of the main bearing shell nearest the pawl to engage the pawl with its ratchet teeth and push the main bearing shell out of the main bearing seat as the nut on the one stud bolt is screwed alternately down and back.

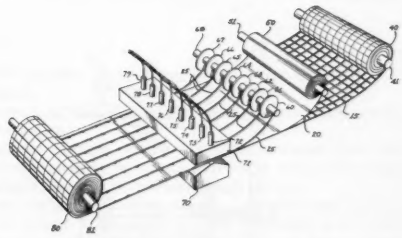
3,886,645
METHOD OF MOLDING AND ASSEMBLING A HINGED PLASTIC CONTAINER
Peter T. Schurman, Woodbridge, Conn., assignor to The Plastic Forming Company, Inc., Woodbridge, Conn.
Division of Ser. No. 186,357, Oct. 4, 1971, Pat. No. 3,796,780, which is a division of Ser. No. 9,529, Feb. 9, 1970, Pat. No. 3,659,999. This application June 13, 1973, Ser. No. 369,514
Int. Cl. B23p *11/00;* **B29c** *17/07, 27/30*
U.S. Cl. 29—434 **4 Claims**

1. The method of making a container having molded cover and body parts joined by a pinned hinge which comprises molding each of said parts by moving cavity-defining mold sections into engagement about a length of tubing of thermoplastic material, moving opposed portions of said tubing against each other and shaping said portions to form a hinge pin bearing wall portion having a wall thickness substantially twice that of said tubing and a hinge pin receiving wall portion adjacent the bearing wall portion, and expanding another portion of said tubing within the cavity to form the container part integral with said hinge portions, said parts being molded separately and thereafter assembled and the hinge portions of the body part being arranged to interfit the hinge portions of the cover part when said parts are assembled, assembling said



cover and body parts, forming hinge pin receiving openings through said hinge pin receiving wall portions adjacent said bearing wall portions, and inserting a hinge pin through said openings in bearing relation to said bearing wall portions to join said parts in assembled hinged relation.

3,886,646
METHOD FOR CONSTRUCTING AN AWNING
John C. Broderson, 3017 W. Almeria, Phoenix, Ariz. 85009
Filed May 30, 1974, Ser. No. 474,815
Int. Cl. B23k *31/02*
U.S. Cl. 228—182 **3 Claims**



1. A method for forming an awning of any given width and length, said method comprising the steps of:

a. transporting a length of wire mesh having laterally and longitudinally oriented wires through a welding machine;

b. laying a length of sheet material of the wire mesh for transportation with the wire mesh;

c. positioning a plurality of retaining wires on the sheet of material in alignment with the longitudinally oriented wires of the wire mesh;

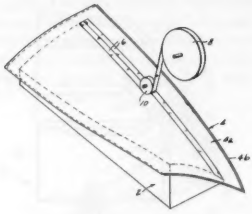
d. forming holes within the sheet of material at selected intersections of the retaining wires and the laterally oriented wires of the mesh; and

e. attaching the retaining wires to the laterally oriented wires of the wire mesh through the holes within the sheet of material.

3,886,647
METHOD OF MAKING EROSION RESISTANT ARTICLES
John A. Alexander, Painesville, Ohio, assignor to TRW Inc., Cleveland, Ohio
Division of Ser. No. 160,342, July 7, 1971, abandoned. This application Apr. 25, 1974, Ser. No. 464,138
Int. Cl. B23k *31/02*
U.S. Cl. 228—175 **10 Claims**

1. The method of making a shaped article which comprises positioning a first bi-metal sheet in a shaping means having a contour corresponding to the desired shape, the inner layer of

said shape being made of metal less erosion resistant than the outer layer, forming a metal matrix core assembly over that first bi-metal sheet, covering the assembly with a covering sheet of the same type as said first bi-metal sheet, the inner



layer of said bi-metal sheets corresponding to said matrix metal, welding together the edges of the first sheet and the covering sheet to encase the core assembly, and diffusion bonding said metal sheets and core under heat and pressure.

3,886,648

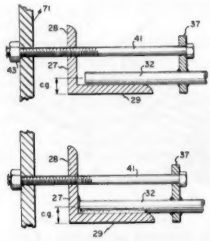
METHOD OF MANUFACTURING REINFORCED CONCRETE PANELS

Burton M. Kahn, 51 Gillett St., West Hartford, Conn. 06105

Division of Ser. No. 124,322, March 15, 1971, Pat. No. 3,774,359. This application Aug. 10, 1973, Ser. No. 387,353

Int. Cl. B21d *39/00*

U.S. Cl. 29—452 **7 Claims**



1. A method for manufacturing reinforced panels, comprising the steps of:

A. forming a peripheral closed framework of interconnected members of relatively high tensile strength;

B. securing a reinforcing network to said framework members at a plurality of centers of gravity of the framework member;

C. casting material to substantially fill the framework and surroundingly support said reinforcing network,

D. cleaning said framework members prior to casting; and

E. applying a casting material and framework member bonding agent to said framework prior to casting.

3,886,649

PROCESS FOR COLD FORMING A METAL TUBE WITH AN INWARDLY THICKENED END

Joseph A. Simon, 8620 Mt. Elliott, Grosse Pointe Farms, Mich. 48211

Division of Ser. No. 384,441, Aug. 1, 1973, Pat. No. 3,837,205. This application July 1, 1974, Ser. No. 484,423

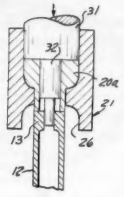
Int. Cl. B23k *27/00*

U.S. Cl. 29—470.3 **2 Claims**

1. A method for forming an elongated tubular metal axle-like part having one end formed with reduced outer diameter portions and the opposite end formed with an inwardly thickened portion and a central barrel portion of uniform diameter and thickness, comprising:

separately forming the part in two separate pieces, namely, one piece having the formed reduced outer diameter portions with that piece terminating at the barrel portion, and a second piece consisting of the barrel portion and the inwardly thickened portion, comprising extruding said second piece by:

positioning a relatively short tubular blank within a die mounted upon the base of a press having an aligned ram, with the die having an open inlet end with a blank receiving portion and an outlet end having an inwardly extending annular extrusion shoulder whose inner cross-sectional diameter is smaller than that of the blank receiving portion for extruding the blank therethrough;



ram pushing the blank partway through the die shoulder for thereby extruding the barrel portion on the blank, leaving the remaining portion of the blank still within the die blank receiving portion;

next, inserting a second, identical blank into the die blank receiving portion in end to end contact with the first mentioned blank;

then ram pushing the second blank through the die shoulder to form a barrel portion thereon, thereby simultaneously forcing the first blank completely through the die shoulder to cause the portion previously remaining within the die blank receiving portion to flow inwardly to form the inwardly thickened portion of the piece, and then repeating the cycle of inserting a new blank, etc.;

and thereafter welding said extruded second piece to a preformed first piece end to end, to form the completed axle-like part.

3,886,650

METHOD AND APPARATUS FOR PRECRIMPING SOLDER RINGS ON ELECTRICAL TERMINAL POSTS

Robert Franklin Cobaugh, Elizabethtown, and James Ray Coller, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 455,765, March 28, 1974, abandoned. This application May 2, 1974, Ser. No. 466,322

Int. Cl. B23k *31/02*

U.S. Cl. 228—136 **27 Claims**

12. A method for placing solder rings on terminal posts secured to a common carrier comprising the steps of:

heating the terminal posts to a temperature adequate to melt solder; and

pressing the heated terminal posts into the edge of, but not through, a ribbon of solder which is positioned vertically with respect to said heated terminal posts.

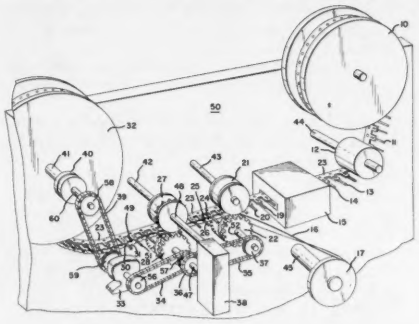
21. A method for placing solder rings on terminal posts secured to a common carrier comprising the steps of:

forming notches in a ribbon of solder;

positioning the individual terminal posts of a carrier held strip of terminal posts in said notches in said notched solder ribbon and with the plane of the solder ribbon substantially normal to the direction of the terminal posts; and

passing the assembly comprising the carrier held terminal posts positioned in the notches in the solder ribbon

through a pair of rollers having a perimetric profile constructed to crimp the solder ribbon between the terminal posts to force sections of the solder ribbon around said



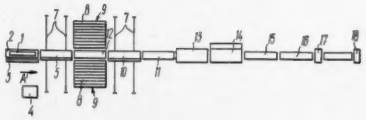
terminal posts to ensure an equal distribution of solder around each terminal post when the terminal posts are gang inserted in a circuit board and heated.

3,886,651

METHOD OF PRODUCING TUBES FROM SHEET METAL BLANKS ON MILL

Alexandr Borisovich Vernik, prospekt Lenina, 30/13, kv. 54; Viktor Fedorovich Listkov, ulitsa Pobedy, 20, korpus 2, kv. 20; Boris Pavlovich Skorupsky, prospekt Lenina, 20, kv. 20; Mark Izrailevich Grinshpun, ulitsa Pushkina, 4, kv. 21; Petr Iosifovich Tetelbaum, prospekt Lenina, 20A, kv. 45, all of Elektrostal, Moskovskoi oblasti; Anatoly Sergeevich Tyrtov, Noginsky raion, derevnya babeevo, 14, Moskovskaya oblasti; Vladimir Petrovich Konyaev, ulitsa Pushkina, 31, kv. 39, Elektrostal, Moskovskoi oblasti; Ivan Petrovich Afanasiev, ulitsa Sovetskaya, 2/102, kv. 62, Elektrostal, Moskovskoi oblasti; Igor Illarionovich Kazakevich, prospekt Lenina, 28, kv. 44, Elektrostal, Moskovskoi oblasti; Pavel Nikitovich Kalinushkin, ulitsa Kirova, 8, kv. 17, Dnepropetrovsk; Ivan Ivanovich Andreev, ulitsa Mechnikova, 3, kv. 2, Khartsyzsk, Donetskoi oblasti, and Alexandr Alexandrovich Sukhanov, prospekt Lenina, 10A, kv. 67, Elektrostal, Moskovskoi oblasti, all of U.S.S.R.

Filed Oct. 11, 1973, Ser. No. 405,644
Int. Cl. B23k *31/02*
U.S. Cl. 228—103 **3 Claims**



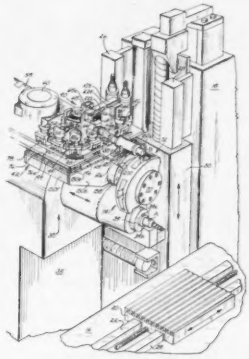
1. A method of producing pipes from sheet metal blanks on a mill, comprising the steps of: feeding successively sheet metal blanks having elongated edges in a progression following each other; measuring the length of each said blank; leaving in the progression pairs of successively fed blanks whose difference in length is less than a preset value; removing from said progression the blanks having no pair blanks in the progression with the difference in lengths less than the preset value; selecting from said progression of successively fed blanks a pair of blanks to each successively fed blank with a difference in lengths less than the preset value and returning said blanks into the progression of blanks; treating the edges for welding of each blank; forming a half-cylinder from each fed blank; assembling a pipe from a pair of the formed half-cylinder blanks with subsequent welding of edges in the half-cylinder blanks assembled into a pipe; and trimming the edges of the resultant pipes.

3,886,652

TOOL CHANGER MECHANISM

Alexander D. Roubloff, deceased, late of West Hartford, Conn., and Adolf E. Peiser, Windsor Locks, Conn., assignors to Colt Industries Operating Corp., West Hartford, Conn.

Filed Oct. 24, 1971, Ser. No. 299,781
Int. Cl. B23q *3/157*
U.S. Cl. 29—568 **24 Claims**



1. In a machine tool, the combination comprising:
a frame;
a vertical slide secured to the frame for vertical movement thereupon;
a spindle housing, having a spindle, mounted upon the vertical slide for horizontal movement, the spindle being adapted to receive and lock a tool therein;
a tool changer supporting structure vertically spaced above the spindle housing and directly connected to and supported by the vertical slide so as to extend laterally from the face thereof in cantilever fashion such that the load carried thereby is not transmitted to the spindle housing; a tool storage magazine secured to the supporting structure for carrying a plurality of tools and presenting a selected tool to a tool transfer position;
a tool transfer arm mounted upon the supporting structure intermediate the magazine and the spindle for rotation about an axis;
first and second angularly spaced clamping devices operatively connected to the transfer arm for selective extension and retraction relative to the axis of rotation in mutually transverse directions to respectively grasp and release a tool;
first and second actuators respectively operatively connected to the first and second clamping devices for the extension and retraction thereof; and
an indexing device operatively connected to the transfer arm for rotating the transfer arm between first, second, third and fourth index positions such that the first clamping device may extend and grasp the selected tool in the transfer position in the first index position, the second clamping device may extend and grasp a used tool in the spindle in the second index position, the selected tool held by the first clamping device is aligned with the spindle in the third index position so as to be insertable therein, and the used tool held by the second clamping device is aligned with the magazine in the fourth index position so as to be insertable therein.

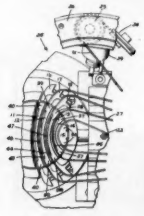
3,886,653
METHOD AND APPARATUS FOR DEVELOPING AND PLACING ELECTRICAL COILS

Richard B. Arnold, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Continuation of Ser. No. 237,829, March 24, 1972, Pat. No. 3,797,105. This application Feb. 8, 1974, Ser. No. 440,857The portion of the term of this patent subsequent to Mar. 19, 1991, has been disclaimed.

Int. Cl. H02k *15/00*

U.S. Cl. 29—596 **5 Claims**



1. A method for developing at least one electrical coil formed of at least two independent strands of conductive wire material, and placing side turn portions of the at least one electrical coil in slots of a magnetic core, the coil having side turn portions adapted to be accommodated in selected magnetic core slots and having predetermined portions for moving adjacent the entrances of magnetic core slots; the method comprising the steps of: disposing at least two independent strands of conductive wire material substantially simultaneously about winding turn size determining means by moving winding turn developing means about the winding turn size determining means, constraining the at least two independent strands of substantially simultaneously disposed conductive wire material from crossing one over another in either of at least two predetermined portions of the at least one coil; and moving the at least two predetermined portions of the at least one electrical coil along the entrances of preselected slots of the magnetic core.

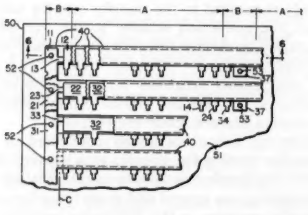
3,886,654
METHOD OF MANUFACTURING LAMINATED BUS BARS

Harvey B. Erdle, Rochester, N.Y., assignor to Eldre Components, Inc., Rochester, N.Y.

Filed Jan. 22, 1974, Ser. No. 435,598

Int. Cl. H01b *13/00*

U.S. Cl. 29—624 **10 Claims**



1. A method of producing laminated bus bars from flat, electrically conductive blanks of the type having at least a pair of spaced side sections connected by a plurality of transverse strip sections, comprising

stacking a plurality of said electrically conductive blanks and a plurality of flat, dielectric insulator blanks in alternating relation, with the spaced side sections and the transverse strip sections on each electrically conductive blank registering vertically with similarly shaped side and strip sections, respectively, on the remaining blanks in the stack, and with the insulator blanks having overlapping marginal edges projecting slightly beyond the edges of the electrically conductive blanks.

laminating part of the stacked blanks to bond together registering portions thereof other than in the areas of said side sections,

removing said side sections of the electrically conductive blanks from the strip sections thereof after the first-named laminating operation,

laminating the remainder of the stacked blanks to bond together overlapping portions of the insulator blanks in the areas previously occupied by the side sections of the electrically conductive blanks, and

severing the laminated portions of the insulator blanks in the areas previously occupied by said side sections of said electrically conductive blanks to separate the spaced stacks of laminated strip sections from each other.

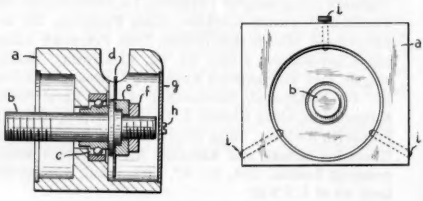
3,886,655
CUTTING DEVICE FOR FLEXIBLE SPIRAL TUBES AND CABLES

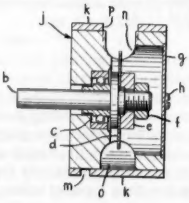
Sandor Molnar, 5630 Riverdale Ave., Bronx, N.Y. 10471

Continuation-in-part of Ser. Nos. 300,497, Oct. 25, 1972, and Ser. No. 206,970, April 17, 1972. This application Nov. 19, 1973, Ser. No. 416,857

Int. Cl. B21f *13/00*

U.S. Cl. 30—90.3 **9 Claims**





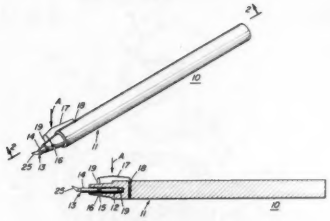
1. Apparatus for cutting flexible spiral tubes and the like comprising a housing, said housing having at least one groove positioned on an exterior surface thereof for accepting said tubes, chamber means in said housing, said groove having an opening into said chamber, an axle rotatably mounted in said

chamber and extending from a surface of said housing, said axle being positionally fixed with respect to said groove, the axis of said axle being substantially perpendicular to the plane of said groove, a hacksaw blade within the chamber and fixedly mounted on said axle, said hacksaw blade having a portion thereof extending into said groove through the said opening, said hacksaw blade being otherwise contained entirely within said housing, said axle having means for accepting a drill motor to rotate said axle and said hacksaw blade, and an additional groove in said housing, said additional groove being of a different size than the first-mentioned groove.

3,886,656
SWIVEL KNIFE

Avram Meshulam, Edison, N.J., and Jerome Rebold, Baltimore, Md., assignors to CBS Inc., New York, N.Y.

Filed Apr. 11, 1974, Ser. No. 460,129
Int. Cl. B26b *1/02, 5/00*
U.S. Cl. 30—164.9 **2 Claims**



1. A swivel knife comprising:

a blade unit comprising an elongated cylindrical body having a blade element at one end thereof, said body having an annular retaining groove therein;

a housing having an elongated passage extending longitudinally in one end thereof, said passage having a length proportioned to receive at least a portion of the length of said body so that said blade element protrudes from said housing, said housing having a slot at a position corresponding to the groove in said body; and

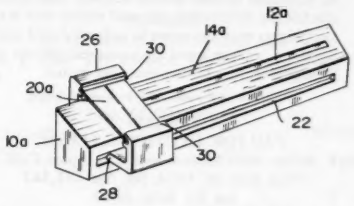
manually actuable retaining means comprising a single length of spring-bias wire mounted at one end in said housing and having a loop at its other end which communicates with said groove through said slot, said wire being manually actuable by bending against the bias thereof to disengage said groove to render said body removable from said housing.

3,886,657
WINDSHIELD WIPER SHARPENER

Ralf Fabian, 634 Cedar St., Mamaroneck, N.Y. 10543

Filed Feb. 28, 1974, Ser. No. 446,943
Int. Cl. B26b *13/22;* **B26d** *3/02*
U.S. Cl. 30—294 **1 Claim**

1. A sharpener for windshield wipers and the like comprising a guide body, said body having a slot extending therethrough with an opening on a first side and a second opening on an opposing, second side thereof, one of said sides having an inclined surface, a blade holder slidably mounted on said sharpener and adapted to retain a blade in close association with said, inclined surface, said body having opposing grooves formed in sides of the sharpener other than said first and second sides, said holder having interiorly directed bottom members engaging said grooves, whereby the blades of said

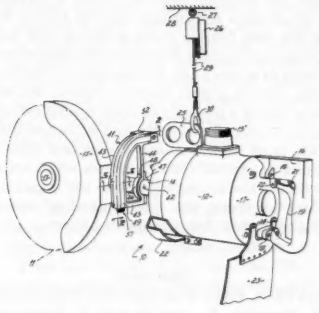


holders are maintained in accurate disposition relative to said inclined surface.

3,886,658
HAND-HELD POWER SAW

Mark W. Wikoff, Mason, Ohio, assignor to The Wolf Machine Company, Cincinnati, Ohio

Filed May 13, 1974, Ser. No. 469,123
Int. Cl. B23d *45/16*
U.S. Cl. 30—388 **3 Claims**



1. A hand-held power saw comprising

a saw blade,

a motor drivingly connected with said saw blade, said motor being located beyond the periphery of said saw blade,

a main handle fixed to said motor at the end thereof opposite said saw blade, said main handle incorporating an off/on switch for said motor adapted to be activated by a trigger member, said main handle being located in the plane of said saw blade, and

a dual grip safety handle connected to said saw and interposed between said motor and said saw blade, said safety handle lying in a plane substantially transverse to the plane of said saw blade, said dual grip safety handle including

a first handgrip section of generally arcuate configuration that defines an arc of at least about 90°, said first section being fixed to said saw,

a second handgrip section that extends along said first section's length from one end thereof to the other, said second section being movably connected to said first section, thereby permitting said second section to be squeezed toward first section regardless of where said safety handle is held along its length,

spring means interposed between said first and second handgrip sections, said spring means continuously biasing said second section away from said first section,

restraint means interconnecting said first and second handgrip sections, said restraint means defining the

outer limit permitted of said second section from said first section as biased by said spring means, and

a safety switch fixed to said first section and adapted to be activated by said second section, said switch being electrically connected with said off/on switch such that said trigger member must be activated and said second handgrip section must be squeezed toward said first handgrip section to energize said motor.

3,886,659

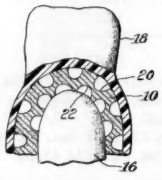
PAD FOR ARTIFICIAL TEETH

Milton F. Reifke, 9890 Monroe Ave. Ext., Aptos, Calif. 95003

Filed June 20, 1974, Ser. No. 481,342

Int. Cl. A66c *13/00*

U.S. Cl. 32—2 **3 Claims**



1. A pad for artificial dentures which is formed from a material which does not irritate mucous tissues and which defines a thin soft flexible cushion having first and second opposite major surfaces for detachably but securably engaging a dental plate of a user to an adjacent gum to enable the user to wear the plate in proper manner without discomfort, the first surface having a plurality of small spaced recesses which act as suction cups and secure the first surface to the adjacent gum by forces of suction alone, the second surface having another plurality of small spaced recesses which act as suction cups and secure the second surface to the adjacent plate by forces of suction alone, the open ends of all recesses being flush with the main surfaces containing same.

3,886,660

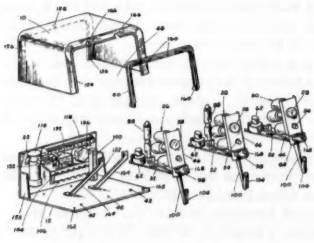
CONTROL UNIT FOR DENTAL EQUIPMENT

Henry M. Thornton, Jr., and Richard E. Plowman, both of York, Pa., assignors to Dentsply Research & Development Corp., Milford, Del.

Filed Apr. 4, 1969, Ser. No. 822,806

Int. Cl. A61c *7/00*

U.S. Cl. 32—22 **12 Claims**



1. A dental control unit comprising in combination, a substantially horizontal plate-like base arranged to be supported stationarily, a housing detachably connectable to said base, a plurality of compact control modules positioned in side-by-side relation within said housing and operable respectively to control the operation of different dental instruments, each module comprising a sub-frame having a portion complementary to said base, means detachably connecting said complementary portions of said sub-frame of said modules to said base, dental utility supply control valves connected to said sub-frame of each module and supported thereby, supporting wall means connected to and supported by the rear portion of said base and extending upwardly therefrom, dental utility manifold means supported directly and compactly within said housing by said wall means, conduits connected between said control valves of said modules and manifold means, a bezel supported by the forward portion of said base and engaged by the forward portion of said housing, and front face panels respectively carried by said sub-frames of said modules and arranged in side-by-side relation to each other relative to said bezel to comprise a composite planar front wall of said housing and said bezel overlying the edge portions of said composite arrangement of front face panels.

3,886,661

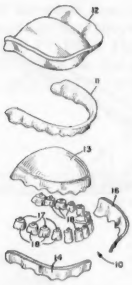
DENTAL PROSTHETIC DEVICE TEACHING AID

Max A. Neill, Hampton, Va., assignor to The Neill Technique, Inc., Hampton, Va.

Continuation of Ser. No. 67,553, Aug. 27, 1970, abandoned. This application Aug. 21, 1972, Ser. No. 282,120

Int. Cl. A61c *19/00*

U.S. Cl. 32—71 **10 Claims**



1. A teaching aid for instruction of terminology of dental prosthetic devices comprising:

a plurality of components including a dental prosthetic base plate; a biterim adapted to mate with said base plate; a plurality of teeth, each including key means adapted for receipt by said biterim; and a plurality of flanges adapted to mate with said base plate, said biterim, and said teeth; an adhesive adapted for adhering said components together to form a model of a dental prosthetic device; and a set of instructions for teaching the form and terminology of a dental prosthetic device.

3,886,662

SINGLE LEVER CONTROLLED GEOMETRIC WRITING INSTRUMENT

Eugene E. Zang, Centerville, Va., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed June 21, 1974, Ser. No. 481,719

Int. Cl. B43l *13/00*

U.S. Cl. 33—18 R **10 Claims**

1. A geometric instrument comprising:

a mounting frame;

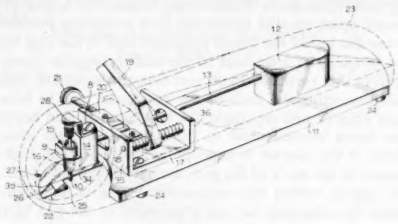
a control assembly for a writing instrument rigidly attached to said frame;

a writing instrument movable by said control assembly;

a writing alignment guide with a straight edge attached to said frame and extending outward therefrom; and

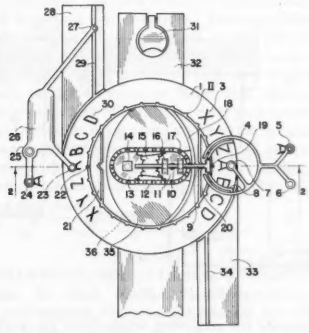
means in said control assembly for moving said writing instrument to engage a writing surface to cause a dot to be formed thereon, and by further action of said means,

cause said writing instrument to be moved generally perpendicular to said alignment guide straight edge to



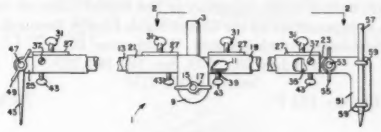
form a solid line from said dot without moving said frame on the surface.

3,886,663
LETTERING SET
Hyok Sang Lew, 1620 East Blacklidge, Tucson, Ariz. 85719
Filed Apr. 13, 1973, Ser. No. 350,723
Int. Cl. B43l *13/10*
U.S. Cl. 33—23 D **9 Claims**



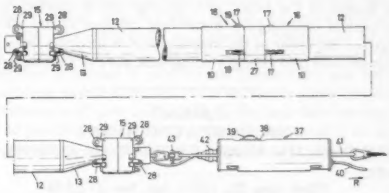
1. In a lettering apparatus for transcribing characters from a template onto a drawing surface, said apparatus comprising:
a. a base-platform movable on the drawing surface;
b. a first gear nonrotatably secured to said base-platform on a post;
c. a second gear rotatably secured to a plate near one extremity of said plate, said plate pivotally secured to said post near the other extremity of said plate;
d. means for inter-connecting said first and second gears; whereby, pivotal movement of said plate in one direction results in equal angular rotation of said second gear in another direction to maintain the constant angular orientation of said second gear;
e. receiving means disposed on said second gear, for slidably receiving a first scribing device to said second gear, a first scribing device slidable received in said receiving means, said receiving means providing linear movement of said first scribing device relative to said second gear in a first direction generally parallel to said drawing surface while restraining said first scribing device from rotating about an axis parallel to the axis of said second gear; and
f. said pivotal movement of said second gear about said post defining and providing the movement of said first scribing device connected to said second gear in a second direction generally parallel to said drawing surface and generally transverse to said first direction, said first and second directions not being parallel to one another,; whereby, said first scribing device is movable on said drawing surface in both said first and second directions and restrained from rotation about its own axis.

3,886,664
EXTENSIBLE BEAM COMPASS
Frederick J. Coil, 109 Latham Trailer Ct., Latham, N.Y. 12110
Filed May 1, 1974, Ser. No. 465,808
Int. Cl. B43l *9/04*
U.S. Cl. 33—27 C **10 Claims**



1. An adjustable, extensible beam compass for drawing circles and arcs normal to the work surface and whose radii can range from minimum to the maximum extension of said compass; said compass comprising tubing members, extensible arms, wedging members, a handle member, a pointer and a bracket; said tubing members each receiving therein end portions of said extensible arms which overlap and tapered wedging members, interposed said extensible arms said tubing members carrying means operable to move said wedging members to releasably lock together said extensible arms, wedging members and tubing members, means pivotally mounting said arms and said handle member, means pivotally mounting one of said arms and said pointer, means pivotally mounting one of said arms and said bracket, and said bracket having means for adjustably mounting and carrying a pencil.

3,886,665
MONITORING APPARATUS
Michael David Lowen, Berkhamsted, England, assignor to John Laing & Son Limited, London, England
Filed Apr. 24, 1973, Ser. No. 354,070
Claims priority, application United Kingdom, May 4, 1972, 20794/72
Int. Cl. G01b *5/20, 5/24*
U.S. Cl. 33—174 R **11 Claims**



1. A monitoring apparatus for measuring varying radii of curvature along an axis of a bore, said apparatus comprising an elongated rigid body member for traversing within the bore, said body member having a longitudinal axis;
a pair of supporting assemblies spaced a predetermined distance from each other to define a chord along said axis of said body member, each said support assembly being universally mounted at a respective end of said body member and having at least three elements urged outwardly to engage an inner surface of the bore to accurately position said axis of said body member relative to the bore;
a carriage mounted for radial movement relative to said body member, said carriage including means engaging

said inner surface of the bore for centering said carriage with respect thereto; and

measuring means mounted on said carriage for indicating radial displacements of said carriage relative to said body member to determine the distance between said chord and the inner surface of bore taken on a line normal to said chord.

3,886,666

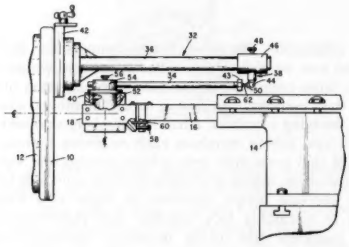
APPARATUS FOR MEASURING TOOL PATH ACCURACY

Charles H. Thompson, Oak Ridge, and Fred W. Jones, Concord, both of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 20, 1973, Ser. No. 381,203

Int. Cl. G01b *5/20*

U.S. Cl. 33—174 P **7 Claims**



1. An apparatus for use with a machine tool adapted to machine an orbicular structure of a uniform radius and comprising a rotatable spindle and a tool carriage supporting a tool holder and a cutting tool wherein the path generated by the cutting tool is controlled by a preselected program; said apparatus utilized for measuring deviations of the path actually generated by the cutting tool from a path defining an arc having a uniform radius, comprising relative motion support means disposed in place of said tool holder, a mechanical coupling projecting between and connected to said spindle and relative motion support means with said mechanical coupling having an effective length corresponding to the length of said uniform radius, pivot means intermediate the spindle and the relative motion support means for effecting pivotal movement of said mechanical coupling without varying the effective length of the latter, and sensing means carried by said mechanical coupling for measuring changes in the effective length of the latter as the machine tool is directed through its program with said changes being indicative of said deviations.

3,886,667

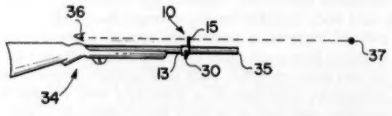
GUN SIGHT ATTACHMENT

Carl E. Rueb, 2211 Murphy Rd. N.E., Calgary, Alberta, Canada

Filed June 22, 1973, Ser. No. 372,536

Int. Cl. F41g *1/00*

U.S. Cl. 33—233 **5 Claims**



1. In combination, a shotgun having a stock and a barrel, said barrel extending from a rear end at which it joins the stock to a front end, and a sight means for preventing vertical over shooting or under shooting of a target, said sight means including a sight attachment positioned approximately halfway between said gun barrel ends, said attachment comprising a rectangular frame defining a rectangular sight opening, said rectangular frame being formed by a pair of thin spaced apart parallel horizontal bars extending horizontally across the top of the barrel perpendicular to the axis thereof and forming the long sides of the said rectangular frame and a pair of thin vertical bars shorter than the horizontal bars and interconnecting the ends of the horizontal bars to form the short sides of said rectangle, the lower one of said horizontal bars being located close to the barrel such that when the cheek of the shooter is improperly positioned too high with respect to the stock of the gun, the barrel forward of the sight will appear within the rectangular frame of the sight and means for attaching the said attachment to the gun barrel.

3,886,668

DRYING OF ARTICLES

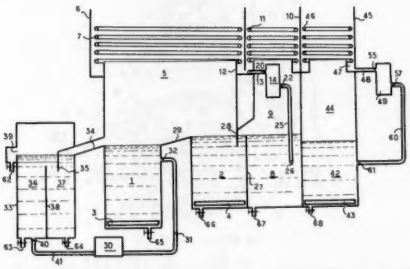
Jean-Pierre Remond, Massy-Villaine; Jean-Robert Thebault, Paris, and Jean-Claude Vitat, Antony, all of France, assignors to Rhone-Progil, Courbevoie, France

Filed May 15, 1974, Ser. No. 469,953

Claims priority, application France, May 16, 1973, 73.17693

Int. Cl. F26b *3/00*

U.S. Cl. 34—9 **8 Claims**

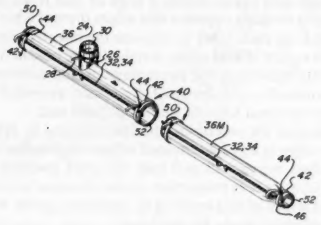


6. Apparatus for removing water from the surface of an article by immersion in a liquid composition which is not miscible with water comprising a water-removal tank for containing said composition having means for heating the composition therein, at least one decantation tank for separating water from said composition and a recycling circuit for the liquid composition connecting the decantation tank to the water-removal tank, a first rinsing tank having means for heating rinsing liquid contained therein, positioned adjacent the water-removal tank, having a space situated above the water-removal tank and first rinsing tank being surrounded by walls, a condenser about the upper parts of the walls, means for passing excess liquid from the first rinsing tank into the water-removal tank and means for passing excess liquid from the water-removal tank into the decantation tank, a second rinsing tank having a space thereabove being surrounded by walls, a condenser about the upper parts of the walls, means for passing excess liquid from the second rinsing tank into the first rinsing tank, means for recovering the condensates obtained by condensation of vapor rising respectively in the space above a water-removal tank and the first rinsing tank and in the space above the second rinsing tank, means for eliminating any water contained in said condensates and means for passing the condensed solvent into the second rinsing tank, and a third rinsing tank having means for heating liquid contained therein, having a space above the third rinsing tank surrounded by walls, a condenser about the upper parts of the walls, means for eliminating any water contained in the condensate obtained therefrom and means for passing the condensed solvent into the third rinsing tank.

3,886,669
AIR DRYER JACKET FOR UNDERGROUND ELECTRICAL CABLES

Thurman A. Pelsue, 3706 So. Hibiscus Way, Denver, Colo. 80237

Filed Oct. 31, 1974, Ser. No. 519,641
Int. Cl. F26b *25/00*
U.S. Cl. 34—107 **5 Claims**

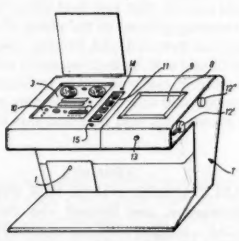


1. The air dryer jacket assembly which comprises in combination: a pair of elongate generally rectangular sheets of heat and moisture-resistant material of the same length, mating elements of a first two-part zipper fastener affixed to adjacent side margins of the pair of sheets effective upon actuation to detachably join same together in side-by-side relation, mating elements of a second two-part zipper fastener affixed to the remote side margins of said pair of sheets effective when brought together and fastened to cooperate with said first zipper fastener in fastened condition to form a single elongate tubular body therefrom open at both ends, means located adjacent opposite ends of the tubular body thus formed operative upon actuation to draw same into a gathered cuff around a workpiece inside thereof, collar-forming means located intermediate the ends of one of said sheets communicating the interior thereof, and one or more drain openings disposed in the other of said sheets.

3,886,670
AUDIO-VISUAL EDUCATIONAL APPARATUS

Rene Lucien, 56 Blvd. Maillot, Neuilly-sur-Seine, France (92200), and Madame Maryvonne LeHenaff, Ker Voa Doue, Louannec, France (22700)

Filed Dec. 7, 1972, Ser. No. 313,170
Claims priority, application France, Dec. 8, 1971, 71.44086; Aug. 2, 1972, France 72.27936
Int. Cl. G09b *7/00*
U.S. Cl. 35—9 A **5 Claims**

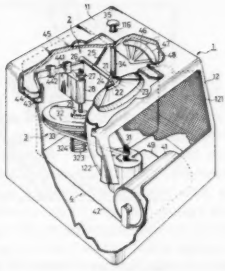


1. A scripto audio-visual educational apparatus comprising a slide projector, a screen on which images of the slides can be projected, a tape recorder having at least two tracks, means for operating said tape recorder in synchronism with said projector, means for memorizing selected slides and acting on said projector and on said tape recorder, means including controls for operating the apparatus in successive stages, a roll of translucent paper, said translucent paper being arrangeable on said screen, and means independent of said projector and tape recorder for winding said translucent paper in one direction or the other on said screen, whereby the paper is adapted for reception of student written or drawn responses, the latter means including motors and switch means controlling said motors.

3,886,671
LINGUISTIC SELF LEARNING DEVICE

Hsing-Ching Liu, Taipei, China /Taiwan, assignor to Hsing-Ching Liu and Ching Huei Wei, both of Taipei, China /Taiwan

Filed May 2, 1974, Ser. No. 466,391
Int. Cl. G09b *5/06;* **G11b** *25/04*
U.S. Cl. 35—35 C **12 Claims**



1. Linguistic self-learning device comprising a case, a recess on top of said case having cuttings therein, a record card to be played for insertion in said recess and having multi-track recording of a plurality of language pronunciations on one side and a picture and words of corresponding languages printed on the other side, said card having position selective projections to match desired ones of said cuttings, a playing unit in said case under said recess movable between first and second positions and having a needle movable in an arcuate slot in said recess, a spring biasing said unit to said second position, a loud speaker swivelly connected to said needle, a shaft connected to said needle, driving means for said shaft comprising an electric motor operatively connectable with a friction disc at the end of said shaft, manually operable clutch means operatively associated with said driving means, and an electric circuit including a limit switch for said motor biased to closed position, whereby when said card is inserted in said recess with said multi-track recording in position to be engaged by said needle and said clutch means is operated, said playing unit is moved to said second position by said spring and said limit switch is moved under its bias to closed position to commence a playing cycle, said playing unit then moving to said first position and said limit switch being operated to open position to open said circuit and complete the playing cycle.

3,886,672
APPARATUS FOR PLAYING AN EDUCATIONAL GAME INCLUDING CODE ORIENTING MEANS

Walter Hesener, 66 Rue de Prulay, 1217 Meyrin, Geneva, Switzerland

Division of Ser. No. 129,469, March 30, 1971, Pat. No. 3,780,453. This application July 25, 1973, Ser. No. 382,503The portion of the term of this patent subsequent to Dec. 25, 1990, has been disclaimed.
Int. Cl. G09b *3/00*
U.S. Cl. 35—48 R **15 Claims**

1. Apparatus for playing an educational game comprising:

a. a housing;

b. at least one setting means operable from outside the housing to be moved into any one of at least two answer

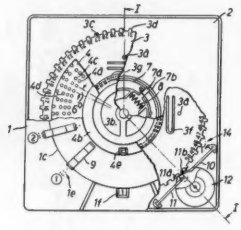
positions, each such answer position being representative of one of several possible answers to a given question;

c. support means carrying the setting means and constructed to allow the setting means to move relative to the support means;

d. code bearing means supported by and at least partly concealed within the housing and movable relative to the support means;

e. a plurality of code means on the code bearing means adapted to co-operate with the said at least one setting means;

f. a code orienting means engageable with one of the support means and the code bearing means whereby the code orienting means and the selected one of the support



means and the code bearing means can be fixed together in any one of a plurality of relative positions;

g. means movably mounting the code orienting means for movement, together with the selected one of the support means and the code bearing means, with respect to the other one of the support means and the code bearing means, said movement being in a direction other than the direction of movement of a setting means to an answer position;

h. first indicating means indicating the position of the code orienting means relative to the selected one of the support means and the code bearing means; and

i. second indicating means indicating the position of the code bearing means relative to the setting means.

3,886,673

SKI BOOT WITH FORWARD LEAN WEDGE

Donald R. Check, Glastonbury, and Lawrence L. Kilbourn, Middletown, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed July 5, 1974, Ser. No. 486,265

Int. Cl. A43b *00/00*

U.S. Cl. 36—2.5 AL **8 Claims**

1. A ski boot comprising a first portion which, when the boot is worn, surrounds a lower portion of the lower leg of the wearer, and a second portion which receives the foot of the wearer, said first portion comprising:

a. a front part having an upper terminal edge;

b. a rear part connected to said front part for pivotal movement with respect thereto, said rear part having an upper terminal edge;

c. first means for securing said rear part to said front part to establish a desired combined predetermined circumferential dimension for said upper terminal edges of said front and rear parts;

d. an opening formed in said front part and extending through said upper terminal edge of said front part, said opening forming opposed side edges thereof which can be offset from each other to increase the effective circumferential extent of said upper terminal edge of said front part thereby increasing the percentage of said combined predetermined circumferential dimension provided by said upper terminal edge of said front part; and

e. a member for insertion into said opening to retain said side edges in a predetermined offset relationship whereby said first means will pull said rear part pivotally toward said front part in proportion to the distance between said offset edges of said opening to establish a given minimum forward lean angle for the boot.

3,886,674

ARTICLE OF FOOTWEAR

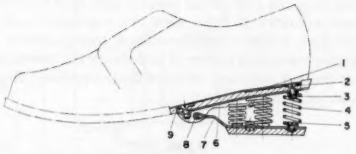
Rafael Saurina Pavia, Plaza del Caudillo No. 8, San Juan de Enova, Spain

Filed Nov. 23, 1973, Ser. No. 418,495

Claims priority, application Spain, Nov. 23, 1972, 185992

Int. Cl. A43b *21/30*

U.S. Cl. 36—38 **7 Claims**



1. In an article of footwear, a combination comprising a sole having a toe end and a heel end; a heel located at said heel end and having one portion closer to and another portion farther from said toe end, said heel including a ground-engaging part having a surface facing said sole, and a plate part overlying said surface and having in the region of said one portion a bend extending towards said sole; pivot means connecting said bend with said sole, so that said heel can pivot about a transverse axis extending parallel to the plane of said sole; biasing means interposed between and bearing upon said heel and said heel end of said sole, so as to normally maintain said other portion spaced from said sole and to resiliently resist pivoting of the heel toward said sole; and connecting means connecting said biasing means with said heel and said sole, respectively.

3,886,675

ADJUSTABLE AUGER COVER FOR SNOW BLOWER

Hubert Maisonneuve, and Helmut von Beckmann, both of Columbia, S.C., assignors to Canron Inc., Phillipsburg, N.J.

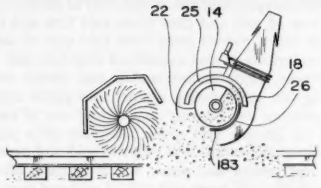
Filed May 17, 1974, Ser. No. 471,127

Int. Cl. E01h *8/06*

U.S. Cl. 37—25 **19 Claims**

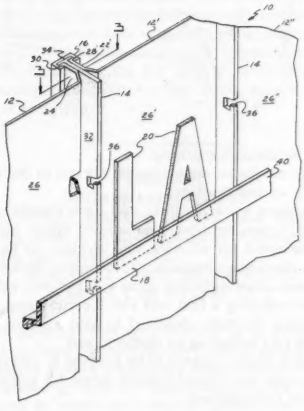
1. An apparatus for clearing snow from the roadbed of and about the rails of railroad track comprising a rotatable, elongated sweeping device, first support means for mounting said sweeping device at the front of a rail vehicle in a track sweeping position, auger means including at least one auger rotatable about a horizontal axis, and shroud means, second support means for mounting said auger means on said vehicle in

front of said sweeping device, said shroud means covering an area extending around a substantial portion of the circumference of said auger and including a first shroud member pivotable between a front and a rear position, whereby, in operation, when said first shroud member is in said front position, said sweeping device sweeps snow forwardly and upwardly



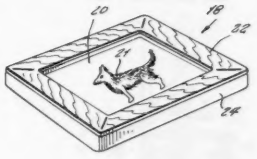
and said auger means catches snow swept by said sweeping device and removes the caught snow to a suitable location away from said track, and when said first shroud member is in said rear position, said auger means contacts snow entering said auger means directly from the front of said auger means and removes the snow to said suitable location.

3,886,676
SIGN FACING ASSEMBLY
Louis Alfonso, 207 Churchill St., Pittsfield, Mass. 01201
Filed Dec. 28, 1973, Ser. No. 429,101
Int. Cl. G09f *07/08*
U.S. Cl. 40—125 F **6 Claims**



1. A sign facing assembly comprising a plurality of panels, said panels having each side thereof directed rearwardly is a plane substantially perpendicular to the front of said panel and having its extreme edges directed inwardly of each side so as to face each other, a T-shaped rib interposed between and abutting the sides of adjacent panels, said T-shaped rib having its main flange extending forwardly toward the front of said panels, a C-shaped interlocking member disposed in contact with the cross member of said T-shaped rib and the edges of said adjacent panels to thereby hold said adjacent panels together as a single unit and means for supporting characters or other indicia including a track disposed across the width of said sign facing assembly affixed to the main flanges of said T-shaped ribs.

3,886,677
BORDER FRAME FOR PICTURES
Harry L. Behring, and George Spector, both of c/o 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007
Filed Sept. 12, 1973, Ser. No. 396,608
Int. Cl. G09f *1/10*
U.S. Cl. 40—152 **2 Claims**



1. A picture framing device for conveniently mounting and framing a picture with an inexpensive decorative border comprising a rigid rear base in combination with a picture frame border mounted peripherally on the front face of said base encompassing a picture on said base, said border being secured to said base by means whereby said border is movable from one position in planar alignment with said picture to other positions projecting beyond the picture surface, wherein said means comprises an inflatable tube mounted on said base, said border being secured to the outer surface of said tube, wherein the base includes a peripheral recess to receive said tube and said border is in planar alignment with the picture when the tube is minimally inflated.

3,886,678
CAMOUFLAGE REMOVER ON DUCK BLIND
Samuel E. Caccamo, 1102 Camino Pablo, San Jose, Calif. 95125
Filed Oct. 10, 1974, Ser. No. 513,660
Int. Cl. A01m *31/02*
U.S. Cl. 43—1 **5 Claims**

1. In combination with a camouflage cover adapted to overlie and conceal the occupant of a duck blind from above and a support having an axis offset relative to center of such blind and cover to afford swinging movement of the cover from above said blind; means for automatically removing such cover from over the blind comprising:

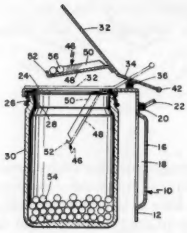
a. a shaft having its upper end secured to the periphery of such cover and its lower end journaled for turning movement in an axis of such offset support;

b. spring means normally urging said shaft in one direction for swinging the cover thereon out of recovering relation to said duck blind;

c. means for releasably latching said shaft into a a position in which the cover thereon is over the duck blind; and

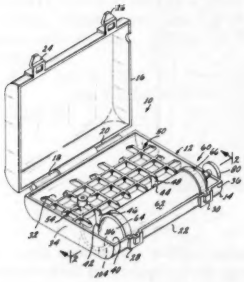
d. lever means operable by pressure applied thereto by the occupant of said blind for releasing said releasable latching means.

3,886,679
FISH BAIT DISPENSER
Sam A. Marcell, 8532 Troy, Lemon Grove, Calif. 92045
Filed July 3, 1974, Ser. No. 485,458
Int. Cl. A01k *97/04*
U.S. Cl. 43—55 **9 Claims**



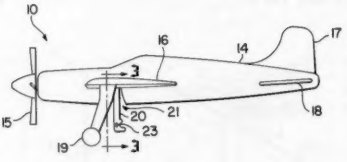
1. A fish bait dispenser comprising:
a. a mounting bracket for a bait jar;
b. a lid pivoted to said mounting bracket to cover the mouth of said jar when in closed position and pivotable into an open position;
c. bait-holding means mounted to said lid and extending into said jar when said lid is closed and capable of engagement with a portion of the bait in said jar;
d. said bait holding means being carried by said lid to a position outside of said jar when said lid is pivoted into said open position.

3,886,680
SIMULATED CAMP-STOVE TOY
Hubert Rich, Westminster, and Robert R. Rosas, Long Beach, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Sept. 27, 1973, Ser. No. 401,527
Int. Cl. A63l *33/30*
U.S. Cl. 46—39 **2 Claims**



1. A simulated camp-stove toy, comprising:
1. a carrying case;
2. an air-outlet orifice mounted in said carrying case;
3. an air pump mounted in said carrying case, said air pump comprising;
A. a hollow cylindrical member;
B. first and second end caps closing said cylindrical member;
C. a piston rod slideably mounted in one of said end caps said piston rod having a first end extending beyond said one of said end caps outside said cylindrical member and a second end extending beyond said one of said end caps inside said cylindrical member;
D. a metering orifice provided in the other of said end caps;
E. a piston assembly slideably mounted on said piston rod intermediate said first and second ends thereof;
F. plate means affixed to said second end of said piston rod for engaging said piston assembly to move it toward said one of said end caps when said first end of said piston rod is moved away from said one of said end caps exteriorly of said cylindrical member; and
G. a power spring encompassing said piston rod and having one end bearing against said piston assembly and another end bearing against said one of said end caps for moving said piston assembly on a pumping power stroke toward said other of said end caps when said first end of said piston rod is released after said movement away from said one of said end caps;
4. conduit means placing said metering orifice in fluid communication with said air-outlet orifice; and
5. simulated cooking-vessel means mounted in said carrying case in fluid communication with said air-outlet orifice.

3,886,681
CONTROL MEMBER FOR TOY AIRPLANE
Gabriel Marason, Jr., Los Angeles, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed Aug. 29, 1973, Ser. No. 392,846
Int. Cl. A63h *27/04*
U.S. Cl. 46—77 **3 Claims**

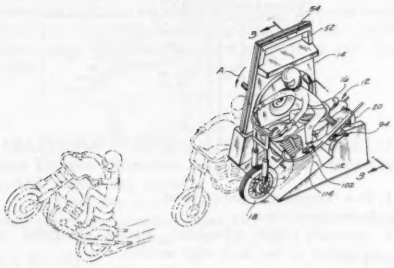


1. A toy airplane comprising:
a fuselage having an open channel normal to the longitudinal axis of said fuselage;
control means located within said open channel and connected to said airplane, said control means being rotatably mounted for allowing said airplane to be flown in both a clockwise direction, and a counterclockwise direction, and either right side up or upside down, said control means including a first end and a second end, said first end being pivotally mounted to said airplane and said second end including an opening; and
control line means adapted to be coupled to said opening of said second end of said control means for controlling the flight of said airplane.

3,886,682
TOY VEHICLE AND LAUNCHER
Michael Ieda, Ft. Solanga, and Frank Ventura, Commack, both of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.
Filed Feb. 1, 1974, Ser. No. 438,821
Int. Cl. A63h *29/20, 17/16*
U.S. Cl. 46—202 **12 Claims**

1. A toy vehicle and launcher therefor, comprising, in combination, a hollow vehicle body having ground engageable wheels rotatably mounted in the body; a flywheel motor mounted in said body in driving engagement with at least one of said ground engageable wheels; and a rotary drive member mounted in said body and operatively connected to said flywheel to rotate the flywheel when the drive member is

rotated; and a launching platform for said vehicle including a base, means on said base for supporting said vehicle with at least one ground engageable wheel in an elevated position out of engagement with the base at a higher level than the other of said ground engageable wheels and for limiting the direction of movement of the vehicle off the launching platform to the driving direction of said one ground engageable wheel, and separate drive means for simultaneously rotating said drive member and for urging said vehicle in a direction oppo-



site to its driving direction and into engagement with said supporting means on the base with said one ground engageable wheel in its elevated position during such rotation, said drive means being adapted to automatically release said vehicle from engagement with said supporting means when the drive to said drive member is stopped, whereby said flywheel is rotated and energized by said drive means and said vehicle is automatically released by said drive means when said flywheel is energized.

3,886,683

DEGRADABLE PLASTIC

Donald E. Hudgin, Princeton Junction, and Murray Reich, Princeton, both of N.J., assignors to Princeton Chemical Research, Inc., Princeton, N.J.

Filed Nov. 27, 1970, Ser. No. 93,393

Int. Cl. C08f *3/12, 45/58*

U.S. Cl. 47—9 **3 Claims**

1. In the growing of an agricultural crop in a field in which the field is at least partially covered with a plastic film for a predetermined growth period, the improvement which comprises ascertaining, from the meteorological data for the geographic area in which said field is located, the amount of TALU for said predetermined growth period, and covering said field with a film having a thickness up to about 100 mils and comprising a polymer comprising at least about 75% by weight of units of butene-1, being over 50% isotactic and having a molecular weight in excess of about 40,000, and about 0.01 to 5% by weight of a stabilizer, the thermal treatment of said polymer prior to the time when it is applied to said field as a film having been such as to reduce its initial stability by at least about 5,000 TALU, said film having a stability approximately that of the TALU determined but at least about 5,000 but not in excess of about 70,000 TALU, whereby the film will degrade after said predetermined growth period, the degradation being accelerated or decelerated in accordance with an acceleration or deceleration of crop growth due to climactic conditions.

3,886,684

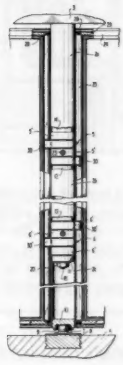
REVOLVING DOOR HANGER ASSEMBLY

Amuel E. Sheckells, Evansville, Ind., assignor to International Steel Company, Evansville, Ind.

Filed Oct. 4, 1973, Ser. No. 403,461

Int. Cl. E05d *15/02*

U.S. Cl. 49—44 **8 Claims**



1. A hanger assembly for supporting the wings of a revolving door on the door center shaft comprising, ring means mounted on said center shaft in coaxial relationship therewith comprising a respective pair of rings for supporting each door wing on said center shaft, the rings of each pair being spaced vertically from each other on the center shaft, first detent means connected between said ring means and said center shaft whereby under normal operating conditions said ring means rotates with said center shaft, each door wing including a marginal frame, the vertical portion of the marginal frame adjacent the center shaft including vertical bar means, a radial knuckle provided on each ring, the vertical bar means of each door wing extending through the knuckles in a respective pair of rings to pivotally connect the door wing thereto, and second detent means connected between said ring means and the vertical bar means of the door wings for holding the door wings in operative, radiating position with respect to said center shaft, said first and second detent means being releasable when a predetermined torque is applied to the door wings allowing the ring means to rotate relative to the center shaft and the door wings to pivot relative to the ring means, whereby the door wings are collapsed into compact parallelism.

3,886,685

IRON WORK FOR HORIZONTAL DISPLACABLE WINGS OF WINDOWS, DOORS OR SIMILAR THINGS

Reinhard Riphagen, Vijverlaan, 408 Krimpen a/d Ijsel, Netherlands

Filed July 25, 1973, Ser. No. 382,498

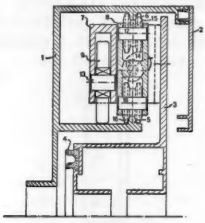
Claims priority, application Netherlands, July 28, 1972, 7210404

Int. Cl. E05d *15/10, 13/02*

U.S. Cl. 49—209 **1 Claim**

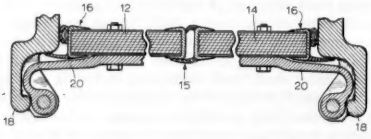
1. A guide-rail roller suspension means which comprises in combination, a support frame having an upper rail and a lower rail disposed thereon, a H-shaped member having an upper wheel and a lower wheel supported thereby, said upper and lower wheels disposed to run along said upper rail and said lower rail respectively, bearing member projecting along opposite sides of the H-shaped member in the direction of travel of said upper and lower wheels, lever-installation having side

surfaces containing arcuate cut-outs, said bearing members disposed within said cut-outs, a suspended member disposed to support a frame closing member, said suspended member being secured to one edge wall of the lever-installation, a wheel supported by the lever-installation opposite the sus-



pended member, and a surface for supporting said wheel, said surface having a groove cut-out portion at a frame closing location whereby upon passage of the wheel to the groove, the weight of the suspended member and attachments causes closing of a frame by movement in a horizontally, downwardly, and frame contacting position.

3,886,686
DOOR CLOSURE SEAL
Burton A. Urbanick, La Grange, Ill., assignor to Met-L-Wood Corporation, Chicago, Ill.
Filed May 22, 1973, Ser. No. 362,659
Int. Cl. E06b *7/22*
U.S. Cl. 49—488 **1 Claim**



1. A composite member adapted to define an edge gasket for a container door or the like as well as a dynamic closure seal with a member adjacent to said door, said composite member comprising:

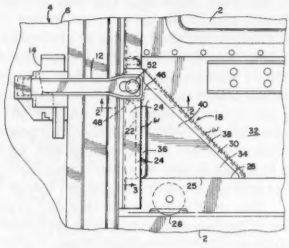
edge gasket means including an elongated channel member, of a relatively rigid plastic material, having a pair of opposed leg portions adapted for securely receiving an edge portion of said container door intermediate said opposed leg portions;

first dynamic sealing means, of a relatively pliable plastic material, comprising a first sealing member composed of an elongated leg portion integrally formed with said channel member and directed oppositely to said channel leg portions;

second dynamic sealing means, of a relatively pliable plastic material similar to said first dynamic sealing means, comprising a second sealing member composed of a hollow and resilient member integrally formed with said channel member, spaced laterally from said first sealing member and directed oppositely to said channel leg portions, said second dynamic sealing means further including an elongate, flexible and resilient tubular insert member disposed within said hollow member for providing further resilience for said second dynamic sealing means;

said hollow member being partially removed to expose the tubular insert in order to provide an adequate seal along corners of said edge gasket, and said first and second sealing members being constructed and arranged for effecting first and second spaced and independent seals with said container door.

3,886,687
RAILROAD CAR DOOR CONSTRUCTION
Harold E. Hesch, St. John, and John W. Hutchison, Crown Point, both of Ind., assignors to Pullman Incorporated, Chicago, Ill.
Filed June 10, 1974, Ser. No. 477,955
Int. Cl. E06b *3/00*
U.S. Cl. 49—503 **8 Claims**



1. In a railroad car sliding door,

a door edge section,

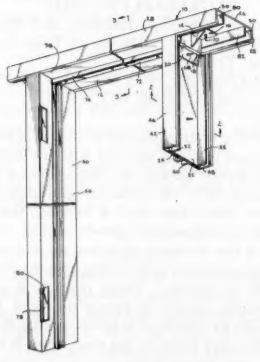
a generally right triangular shaped elongated gusset mounted on the door edge section,

said gusset having a vertical edge, a base edge and a sloped hypotenuse edge,

the junction of the upper portions of the vertical and hypotenuse edges having an apex portion,

an enlarged boss mounted on the apex portion and having a hasp pin projecting outwardly therefrom for pivotally mounting a hasp thereon for attachment to a hasp locking device on the car.

3,886,688
FIRE RESISTANT DOOR FRAME ASSEMBLY
Douglas Ragland, Houston, Tex., assignor to Ragland Manufacturing and Construction Company, Houston, Tex.
Filed Jan. 14, 1974, Ser. No. 432,973
Int. Cl. E06b *1/12*
U.S. Cl. 49—504 **17 Claims**



1. A door frame assembly for mounting in a door opening in a wall comprising:

a header section, said header section including a partition cap extending across the top of said door opening, said partition cap being generally channel shaped and having a web and a pair of limbs, said limbs extending down-

wardly toward said opening on opposite sides of said wall and having cap limb surfaces facing said door opening; and a fascia plate removably disposed in said partition cap between said limbs and having opposite first and second end portions and a lower surface disposed no lower than said cap limb surfaces and facing said door opening;

means defining a first open space longitudinally adjacent said first end portion of said fascia plate; and

vertically disposed first and second side sections on opposite sides of said door opening, said first side section having an upper end abutting said cap limb surfaces of said partition cap and contiguous but unattached to said first end portion of said fascia plate whereby said fascia plate can slide past said upper end of said first side section and a part of said first end portion can move into said first open space upon longitudinal expansion of said fascia plate.

3,886,689

APPARATUS FOR FORMING A TROCHOIDAL SURFACE

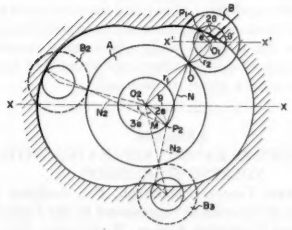
Tsutomu Yoshino, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Oct. 4, 1973, Ser. No. 403,483

Claims priority, application Japan, Oct. 5, 1972, 47-100067

Int. Cl. B24b *5/16;* **B23c** *3/04*

U.S. Cl. 51—43 **10 Claims**



1. Apparatus for forming a trochoidal surface comprising a stationary sun gear, a plurality of planetary gears disposed around and meshing with said sun gear at equ-distant angular positions, each of said planetary gears having a gear ratio of 1:2 to said sun gear, a plurality of rotatable forming tools each having a working surface, one of said forming tools being mounted on each of the planetary gears so that the forming tool working surface is positioned at a point offset by a predetermined distance from the center of the associated planetary gear, means for revolving said planetary gears, a plurality of tool mounting heads for mounting each of said forming tools on the associated planetary gear, each of said tool mounting heads comprising a swingable arm axially slidably engaging said tool and a planetary gear shaft for carrying said swingable arm, said shaft being coaxial with said offset point on the associated planetary gear, a plurality of levers extending along a line through said offset point on each planetary gear and intersecting said meshing point between the related planetary gear and the sun gear, said lever having one end longitudinally slidably receiving the related swingable arm, the other end of the lever being pivotally mounted on a member which is rotatable about an axis coaxial with said sun gear at a common point offset from the axis of the sun gear a distance equal to two times the offset distance of the offset point associated with each planetary gear, and means for displacing each of said forming tools along said swingable arm so as to compensate for any wear of the working surface thereof.

3,886,690

INSTALLATION FOR AUTOMATIC POLISHING

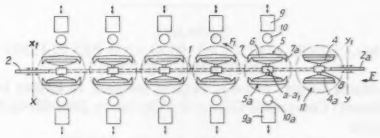
Bruno Plantevin, Rueil, and Jacques Touchard, Fontenay-le-Fleury, both of France, assignors to Regie Nationale des Usines Renault, Billancourt, France

Filed Nov. 27, 1973, Ser. No. 419,246

Claims priority, application France, Nov. 28, 1972, 72.42268

Int. Cl. B24b *5/00, 7/00, 9/00, 47/02*

U.S. Cl. 51—80 A **6 Claims**



1. An installation for polishing workpieces comprising

means for supporting a pair of laterally spaced workpieces to be polished,

means for advancing said workpiece supporting means in step by step manner along a work path comprising two spaced sprockets, a sprocket chain looped thereabout and means for driving the chain for circulating movement about the sprockets,

loading and unloading stations disposed at an end of said chain loop,

polishing stations spaced along the work path and comprising a pair of polishing heads disposed in opposed relation laterally of said work path symmetrically about the plane which includes said axis of workpiece rotation and said work path direction, and

means for rotating said workpiece support means at least 180° about an axis perpendicular to the direction of travel of the said chain.

3,886,691

MACHINE FOR TRIMMING AND BEVELLING OPHTHALMIC LENSES

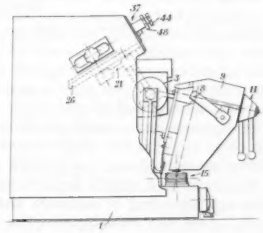
Jean-Marie Godot, Brunoy, France, assignor to Essilor International, Joinville Lepont, France

Filed Oct. 9, 1974, Ser. No. 513,391

Claims priority, application France, Oct. 9, 1973, 73.35999

Int. Cl. B24b *9/14*

U.S. Cl. 51—101 LG **2 Claims**



1. A machine for trimming and bevelling ophthalmic lenses, comprising a frame structure carrying a tool and a contact feeler adapted to engage a trimming templet, said tool and contact feeler determining together a feeler-tool line, a rotatably driven spindle for supporting said templet and a lens to be edged, and having its axis parallel to said feeler-tool line, a support movable in relation to said frame and having said spindle rotatably mounted therein, connecting and guide means for connecting said spindle support to said frame and for so guiding said spindle support that, during penetration of

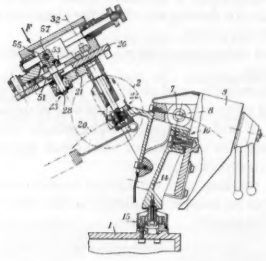
the tool into the lens material as a consequence of the relative movement between said frame and said spindle support, an operative portion of the tool remains substantially on a portion of a so-called meniscus sphere centred to the spindle axis and located within the lens thickness, said connecting and guide means comprising a pair of parallel connecting-rods of same length, pivoted at one end to said spindle support and at the opposite end to said frame, a universal joint being provided for pivotally connecting each connecting-rod to said frame, the universal joints having their centres aligned on a straight line parallel to said feeler-tool line.

3,886,692

MACHINES FOR TRIMMING AND BEVELLING OPHTALMIC LENSES

Jean-Marie Godot, Brunoy, France, assignor to Essilor International (Compagnie Generale d'Optique), Joinville-le-Pont, France

Filed Oct. 9, 1974, Ser. No. 513,497
Claims priority, application France, Oct. 9, 1973, 73.36000
Int. Cl. B24b 9/14
U.S. Cl. 51—101 LG **6 Claims**



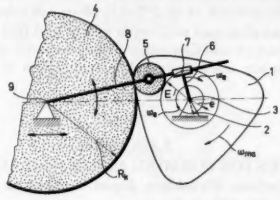
1. A machine for trimming and bevelling ophthalmic lenses, which comprises a frame structure supporting a tool and a contact feeler for engaging a trimming templet, said tool and feeler defining together a feeler-tool line, rotatably driven spindle for supporting said templet and a lens to be edged, and having its axis parallel to said feeler-tool line, a support movable in relation to said frame and having said spindle rotatably mounted therein, connecting and guide means for connecting said spindle support to said frame and guiding same in such a manner that, during penetration of said tool into the lens material as a consequence of the relative movement between said frame and said spindle support, and operative portion of the tool remains substantially on a portion of a so-called sphere meniscus sphere centered to the spindle axis and located within the lens thickness, said guide means comprising at least one meniscus-forming rod pivoted at one end to said frame and at the opposite end to said spindle support, and having a length equal to the radius of said meniscus sphere, said spindle being movable during the relative movements between said frame and said spindle support between two endmost position corresponding to minimum and maximum radii, respectively, of the lens trimming templets, and means for adjusting the radius of said meniscus sphere, said adjustment means comprising second guide means allowing shift of the pivotal connection of said meniscus-forming rod on said frame along a path extending substantially parallel to the chord of a circular arc centered to said operative portion of the tool, having a radius equal to the length of said meniscus-forming rod and described by the point of the spindle axis which is located at a distance from the operative portion of the tool equal to the length of said meniscus-forming rod when said spindle is moved between its two endmost positions, and blocking means for holding said pivotal connection of said meniscus-forming rod at a selected point along said path.

3,886,693

GRINDING MACHINE FOR MACHINING POLYGONAL WORKPIECES

Józef Tajnafői; Károly Gellért; Károly Hidasi; László Gribovszki; Sándor Vékony, all of Miskolc, Hungary, assignors to Nehezipari Muszaki Egyetem, Miskolc-Egyetemvaros, Hungary

Filed Apr. 9, 1974, Ser. No. 459,378
Claims priority, application Hungary, Apr. 24, 1973, NE 509
Int. Cl. B24b 5/16
U.S. Cl. 51—105 EC **5 Claims**



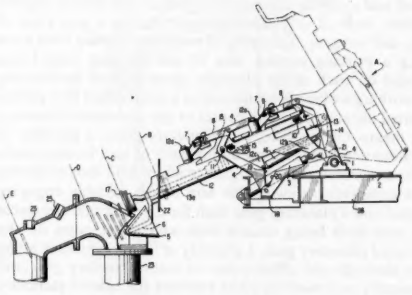
1. A grinding machine comprising a grinding tool, means for rotating said grinding tool about a fixed axis, means for rotating a polygonal workpiece about its own axis in contact with said driving tool, means for rotating said axis of said workpiece about an eccentric axis at a speed of rotation equal to the speed of rotation of said workpiece about its own axis multiplied by the number of sides of said polygonal workpiece, and a correcting mechanism for changing the angular velocity of rotation of the workpiece about said eccentric axis in those sections of that motion which are associated with the grinding of the sides of the polygon while maintaining constant the speeds of rotation of said grinding tool about said fixed axis and of said workpiece about its own axis.

3,886,694

ASCENSION PIPE CLEANING APPARATUS WITH SELF-NDEXING SUSPENSION

Emmanual Victor Gouye, Pittsburgh, Pa., assignor to The United States of America as represented by the United States Environmental Protection Agency, Washington, D.C.

Filed Sept. 26, 1974, Ser. No. 509,466
Int. Cl. B24b 19/00
U.S. Cl. 51—170 PT **7 Claims**



1. An apparatus for removing deposited material from the interiors of the elbows of a row of gas ascension pipes at the top of a battery of horizontal coking chambers having a coal charging larry car movable over the top of the battery alongside the row of ascension pipes into position for charging the chambers of the battery severally, said apparatus comprising: a cradle means having a first male to female indexing means mounted at one end, said cradle being flexibly supported on

said larry car by means of a suspension system which permits said cradle to move freely in the vertical and lateral planes while remaining parallel to its original orientation;

a ram means having a piston rod extending therefrom which is pivotally mounted within said cradle means to said cradle means and to said suspension system;

an abrading means mounted on the free end of said piston rod and reciprocable with said piston rod;

a means for said ram means forward from its inoperative position under the upper lip of the gooseneck opening of a gas ascension pipe to its operative position;

a matching second male to female indexing means to said first male to female indexing means which is mounted on the outside of said gas ascension pipe such that when said cradle is moved forward the indexing means mounted thereon engages the matching indexing means and moves the ram means and cradle means vertically and laterally to an orientation on the axis of said gas ascension pipe.

3,886,695

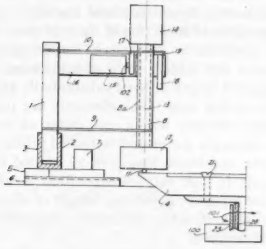
METHOD FOR GRINDING A GEM STONE

Maximo Elbe, Hamburg, Germany, assignor to Colorant Schmuckstein GmbH, Hamburg, Germany

Filed May 17, 1973, Ser. No. 361,037

Int. Cl. B24b *1/00, 9/16*

U.S. Cl. 51—283 **4 Claims**



1. In a method of grinding a gem stone, particularly a diamond, the steps of placing a gem stone to be ground against a rotating grinding wheel; turning said gem stone relative to said grinding wheel for determination of an ideal orientation of said gem stone relative to said grinding wheel; measuring the frictional heating of said gem stone; controlling the contact pressure at which said gem stone contacts said grinding wheel, as a function of the temperature of said gem stone and in such a manner as to maintain said temperature constant; determining the amount of material removal which takes place during the preceding steps; terminating the turning of said gem stone when said ideal orientation is reached; and grinding respective facets of said gem stone with said grinding wheel.

3,886,696

MOUNTING DEVICE FOR OPTICAL LENSES

Erhard Brück, Heuchelheim, Germany, assignor to Wilhelm Loh Kommanditgesellschaft, Wetzlar, Germany

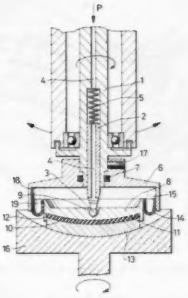
Filed Oct. 1, 1973, Ser. No. 402,321

Claims priority, application Germany, Oct. 26, 1973, 2252503

Int. Cl. B24b *5/16*

U.S. Cl. 51—216 LP **6 Claims**

3. In a mounting chuck for optical lenses for use in a grinding and polishing machine, comprising a movable rod and and lens holder which is connected to said movable rod through universal joint means, the improvement comprising an annular part mounted on said rod and movable therewith and a roll bellows which is generally stiff in a circumferential direction but flexible in an axial direction for connecting said lens holder to said annular part, said roll bellows effecting a torque transmission from said annular part to said lens part and being sealingly engaged with said annular part and said lens holder to define a fluid tight chamber therebetween, said universal



joint means being located in said fluid tight chamber and passageway means for supplying pressurized fluid to said fluid tight chamber to urge said lens holder axially away from said annular part so that said universal joint means only functions to center said lens holder and absorb very small radial and axial forces.

3,886,697

METHODS FOR FINISHING AN APERTURE

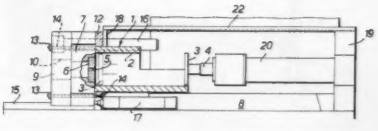
Edward George Feldcamp, 60 Roberts Burns Ave., Benhall, Cheltenham, England

Continuation of Ser. No. 299,247, Oct. 20, 1972, abandoned, which is a division of Ser. No. 73,110, Oct. 17, 1970, Pat. No. 3,699,725. This application Aug. 22, 1974, Ser. No. 499,780

Claims priority, application United Kingdom, Sept. 17, 1969, 45940/69

Int. Cl. B24b *1/00, 5/40, 5/48*

U.S. Cl. 51—317 **3 Claims**

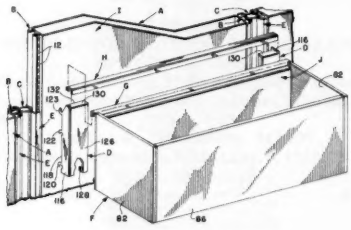


1. A method of finishing an opening in an extrusion tool having an intended extrusion direction, comprising mounting the tool in a holder and extruding an abrasive compound through the opening under pressure in the intended extrusion direction only and into a free space in which the compound is not closely confined, the compound being of solid extrudable nature such that it extrudes into the free space in a shape which simulates the extrusion which would result if the tool were put into service at that time.

3,886,698
PANEL AND STRUCTURAL UNITS FOR WALL ASSEMBLIES

Richard L. Raith, Solon, and Joseph A. Davenport, Middleburg Heights, both of Ohio, assignors to Hauserman, Inc., Cleveland, Ohio

Continuation of Ser. No. 370,477, June 15, 1973, abandoned. This application Aug. 19, 1974, Ser. No. 498,418
Int. Cl. A47g *29/02*
U.S. Cl. 52—36 36 Claims

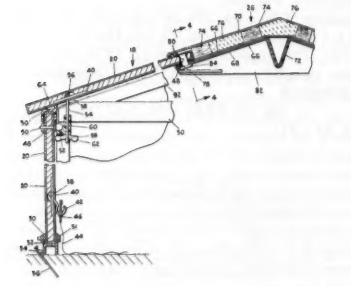


1. In a panel system, a panel having a vertical row of slots along the edge thereof, a bracket having a face plate and an inwardly turned end plate, inwardly projecting tabs on said end plate adapted to engage in selected slots to support said bracket at a desired elevation on said panel with the face plate thereof extending generally parallel to said panel, an accessory mounted on said bracket, and support means on said face plate operative to support said accessory without direct engagement between said accessory and said panel.

3,886,699
PORTABLE BUILDING STRUCTURE

Paul F. Bergmann, Jr., 445 Channel Rd., North Muskegon, Mich. 49445

Filed Aug. 2, 1974, Ser. No. 494,239
Int. Cl. E04b *1/343*
U.S. Cl. 52—90 18 Claims



15. A portable and demountable building structure having a plurality of walls joined together to form an enclosure, and a roof demountably secured and covering said enclosure, the improvement which comprises:

said roof formed of a plurality of substantially equal sized panel members joined together at the sides thereof;

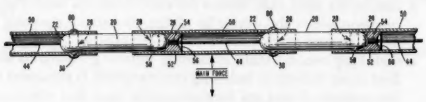
a central ridge connector, said ridge connector being rigid in nature and providing a central support for said roof panels, said ridge connector having slots at opposite sides thereof for receiving an edge of panel members; and

means for rigidly and demountably securing said panel members to said ridge connector at said slots.

3,886,700
COLLAPSIBLE STRUCTURAL MEMBER

William M. Lambert, 1516 Beaver Dam Rd., Point Pleasant, N.J. 08742

Filed Aug. 27, 1973, Ser. No. 391,763
Int. Cl. E04b *1/343*; E04h *12/18*
U.S. Cl. 52—108 15 Claims



1. A collapsible structural member comprising:

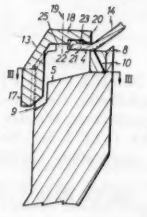
a plurality of rigid elongated inner elements arrangeable in spaced end-to-end relationship and connected together by flexible connecting means attached to adjacent pairs thereof, each of said inner elements being of a first length, a plurality of rigid elongated open-ended outer elements coaxial with said inner elements and arrangeable in alternating relationship with said inner elements, said flexible connecting means extending through the interior of said outer elements, said outer elements being axially relatively movable with respect to said inner elements between an extended position engaging opposite end portions of a pair of adjacent of said inner elements to create a continuous rigid structural member and a retracted position spaced from one of the said pair of adjacent said inner elements to allow said structural member to be collapsed and folded, each of said outer elements being of a second length at least substantially equal to said first length so that said inner elements are positionable substantially entirely within said outer elements when said outer elements are in said retracted position, whereby the effective combined length of all of said inner and outer elements in said retracted position is substantially less than the effective combined length of all of said inner and outer elements when said outer elements are in said extended position,

the cross-sectional configuration of said outer elements and said inner elements being so related to one another as to minimize lateral and angular movement between said inner and outer elements when said outer elements are in said extended position.

3,886,701
TOP FOR A SKYLIGHT SIDE MEMBER

Pierre Emmanuel Eugene Jean Bogaert, Dijk 20, Wemmel, Belgium

Filed Mar. 5, 1973, Ser. No. 337,921
Claims priority, application Luxembourg, Mar. 10, 1972, 64942; Mar. 17, 1972, 64988
Int. Cl. E04b *7/18*; E04d *3/03*
U.S. Cl. 52—200 3 Claims



1. A mounting top for the outwardly extending horizontal edge portions of a skylight comprising:

a frame having at least one elongated side which has a raised inner edge portion, an intermediate horizontal surface portion below the raised inner edge portion and an outer surface sloping downwardly from the horizontal surface portion,

a plurality of alined upright supports spaced along said outer surface, each having a horizontal upper bearing surface above the level of the intermediate surface for supporting the outer horizontal side member of a skylight, an upstanding rib member on the upper surface of each upright support parallel to the inner edge of the frame side for abutting the peripheral edge of the horizontal edge portion of the skylight,

the space between the supports forming downwardly sloping passageways and the rear ends of the supports being adjacent the intermediate horizontal portion of the frame side to form therewith a plurality of channels,

and a water permeable sealing member seated on said intermediate portion of the frame side engaging the underside of the horizontal edge portion of the skylight when seated on the upright supports, to form a ventilation block.

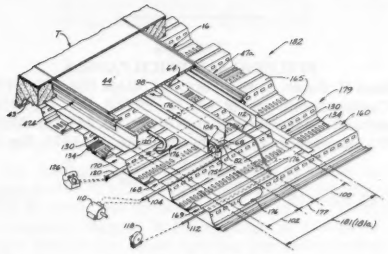
3,886,702
METAL CELLULAR FLOORING UNIT FOR BOTTOMLESS ELECTRICAL CABLE TRENCH

Frank W. Fork, Allison Park, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 342,478, March 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 158,769, July 1, 1971, Pat. No. 3,721,051. This application July 17, 1974, Ser. No. 489,173

Int. Cl. E04b *5/46*; **E04f** *17/08*

U.S. Cl. 52—221 **21 Claims**



1. In a metal cellular flooring unit comprising a corrugated upper metal sheet presenting alternating crests and valleys and webs connecting adjacent ones of said crests and said valleys, and a correlative lower metal sheet secured to said upper metal sheet along contiguous portions thereof and cooperating therewith to define spaced-apart generally parallel enclosed cells; and marginal connecting means along the opposite longitudinal sides of said flooring unit adapting said flooring unit for interconnection with other flooring units; the improvement comprising:

said flooring unit having a transverse region intermediate of its ends, said transverse region having a width of up to about 50 inches;

said flooring unit having a single crest access opening and at least one web access opening residing within said transverse region;

said crest access opening being formed solely in the crest of a first cell and establishing communication between the interior of said first cell and the space above said flooring unit, said crest access opening constituting the only useful access opening in said first cell within said transverse region; and

said web access opening being formed solely in one web of a second cell and establishing communication between the interior of said second cell and the space above the valley adjoining said one web.

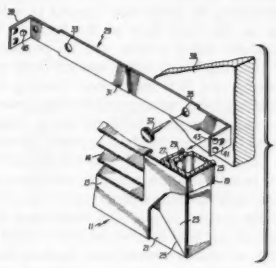
3,886,703
DECORATIVE SHUTTER AND MOUNTING MEANS THEREFOR

Donald L. Rousey, Des Plaines, Ill., assignor to Questor Corporation, Toledo, Ohio

Filed Mar. 20, 1974, Ser. No. 453,163

Int. Cl. E04c *2/38*; **E06b** *7/08*

U.S. Cl. 52—473 **4 Claims**



1. A decorative shutter device for securing to an exterior of a house comprising

an integral plastic skin having a peripheral substantially flat section and an interior slat-like area;

an integral flange about the periphery of said flat section substantially perpendicular to said flat section;

a rigid foam frame secured in abutting relationship within said flat section and said flange, said frame having a substantially rectangular cross section; and

a wall integral with said frame and substantially parallel with said frame opposite said flange;

said wall and said frame forming a channel for accepting a fastener extending outwardly from said exterior of said house.

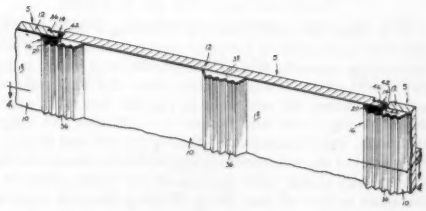
3,886,704
BUILDING SIDING UNIT WITH INTERLOCKING BACKING BOARD AND OUTER PANEL

Lee H. Mattes, South Bend, Ind., assignor to Mastic Corporation, South Bend, Ind.

Continuation-in-part of Ser. No. 197,031, Nov. 9, 1971, Pat. No. 3,780,483. This application Aug. 3, 1973, Ser. No. 385,444. The portion of the term of this patent subsequent to Dec. 25, 1990, has been disclaimed.

Int. Cl. E04c *2/26*, *2/34*

U.S. Cl. 52—530 **2 Claims**



1. A siding unit for a building or like structure comprising an outer panel and a backing board, said outer panel including spaced longitudinal edge portions and a face portion extending between said edge portions, one of said edge portion including a web extending rearwardly of said face portion and terminating in an inturned lip spaced from said face portion to define hook means, retainer means extending along said one edge portion, the other of said edge portion extending rearwardly and terminating in an inturned lip, said retainer means receiving in slidable interlocking cooperating the lip of said

other edge portion of an outer panel in the adjacent siding course, said backing board having spaced side edges and front and rear faces extending between said side edges, the rear face of said backing board terminating spacedly from one of said side edges to define a lip portion of reduced thickness at said one side edge, said backing board having its rear face positioned against said structure with the other of its side edges extending adjacently along and lapping the web of said one edge portion of an outer panel in another adjacent siding course and having its front face located in substantially the same plane as the front face of the backing board in said another adjacent siding course, the lip portion of said first mentioned backing board being spaced from said structure, means securing said first mentioned backing board only to said structure, said first mentioned backing board lapping the outer panel in said another adjacent siding course only at its said web, said first mentioned outer panel having the lip of its other edge portion interlocking with the retainer means of the outer panel in said another adjacent siding course, the hook means of said first mentioned outer panel being fitted over and behind the lip portion of said first mentioned backing board with the web of said first mentioned outer panel overlying the one side edge of said first mentioned backing board, whereby said first mentioned outer panel is retained in position against said structure by the outer panel in said another adjacent siding course and said first mentioned backing board, said outer panels having lower end edges, a horizontally extending retainer bracket, means securing said retainer bracket to said structure, said outer panels abutting said retainer bracket at said end edges.

3,886,705

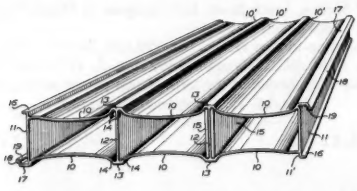
HOLLOW STRUCTURAL PANEL OF EXTRUDED PLASTICS MATERIAL AND A COMPOSITE PANEL STRUCTURE FORMED THEREOF

Georg Valentin Cornland, Helsingborg, Sweden, assignor to Hoganas AB, Helsingborg, Sweden

Continuation-in-part of Ser. No. 122,531, March 9, 1971, abandoned. This application Apr. 30, 1973, Ser. No. 355,376

Int. Cl. E04c *1/10, 1/30*

U.S. Cl. 52—586 **1 Claim**



1. A composite panel structure including a number of hollow structural panels of extruded plastics material, each panel comprising mutually spaced interparallel end walls, at least two intermediate I-beams spaced from the end walls and extending along the end walls in parallel therewith, each I-beam having a web and flanges on each end and integral therewith, which flanges extend along the web and project on both sides of the web generally perpendicular thereto to form substantially planar outer surfaces of the beams, portions on the inner surface of each flange forming channels extending along the web one on each side of the web, the channels formed by opposite flanges of an I-beam opposing each other on the respective sides of the web to receive a stiffening member extending along the web, opposite side walls extending between and joined to the I-beam flanges and the end walls and spanning the spaces therebetween, the side walls having a concave outer surface and a convex inner surface and bounding, together with the end walls and the I-beams, a number of individual cavities, and connecting means on the end walls for interconnecting panels adjoining each other and comprising first and second flanges formed at first and second ends of each of said end walls, of which said first flanges on the opposite end walls of adjoining panels are formed as hook-shaped portions and are diagonally opposed to each other and are joined to said first end of each said end wall by a reverse curve connecting web, said side wall being joined to said reverse curve connecting web portion of said end wall, said second flanges on the opposite end walls of adjoining panels are diagonally opposing each other and have a planar surface generally parallel to said I-beam flanges and are formed each on an extension of the second end of each said end wall extending beyond the adjoining side wall, said hook-shaped first flanges on adjacent end walls of adjoining panels receiving each one of the second flanges on such end walls, each said first flanges including a substantially planar surface extending generally parallel to said planar I-beam flanges and being of substantially the same width and at the same level as said I-beam flanges, an outwardly projecting slanting lip extending from the free end of said planar surface of said first flange and terminating in a ledge projecting inwardly substantially in parallel with said planar surface of said first flange, said planar surface of each said first flanges together with the associated lip and ledge forms said hook-shaped portions, outer planar strip surface portions on said side walls and connected to said extensions, each said strip surface portion extending along an associated extension, each said outer planar strip surface portions abutting said ledge portion of an adjacent panel when said panels are joined, and forming, together with said ledge portion and said extension, a labyrinth seal between said panels, and at least one wedge insertable between adjacent end walls of adjoined panels for forming a spacer between said panels, said wedge having edge surfaces which extend along the first and second flanges formed at the end walls of each of said adjoined panels, pressing each said first flange into firm engagement with each said adjacent second flange.

3,886,706

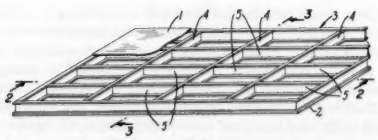
BUILDING SANDWICH PANELS

William H. Baker, Cowan Farm Rd., Rock Hill, S.C. 29730

Continuation-in-part of Ser. No. 99,868, Dec. 21, 1970, abandoned, Continuation-in-part of Ser. No. 257,441, May 26, 1972, abandoned. This application Aug. 31, 1973, Ser. No. 393,691

Int. Cl. E04b *2/28;* **E04c** *2/38*

U.S. Cl. 52—615 **57 Claims**

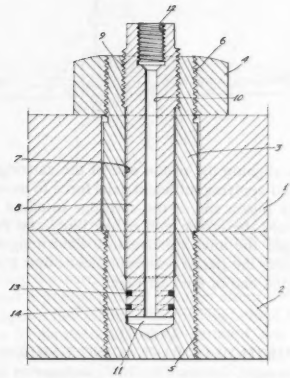


1. A modular building sandwich panel unit comprising a load-supporting frame composed of an interlocking network of a plurality of more than two beams extending substantially in parallel in the load-supporting direction from one end to the other end of the frame and a plurality of more than two beam cross supports extending between the load-supporting beams and interlocked therewith so as to impart structural rigidity to the network, the beams being apertured and the beam cross supports interlocking therewith at the apertures, the tops of the beam cross supports on at least one side being lower than the tops of the beams on that side; and spacer or adaptor members attached to the tops of the beam cross supports bringing them to the same level as the tops of the beams at least one facing panel attached to the spacer or adaptor members; and means for removably attaching the facing panel to the frame.

3,886,707
DEVICE FOR ACHIEVING AN AXIALLY PRE-STRESSED JOINT

Karl Helge Konstantin Heldt, Partille, Sweden, assignor to SKF Industrial Trading & Development Company, Jutphaas, Netherlands

Filed Dec. 15, 1972, Ser. No. 315,470
Claims priority, application Sweden, Feb. 7, 1972, 1364/72
Int. Cl. F16b 5/02
U.S. Cl. 52—758 F 3 Claims

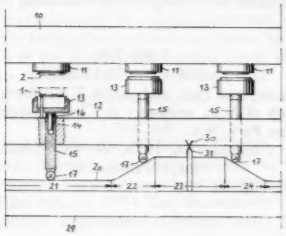


1. The combination comprising at least two parts having openings therein to receive a prestressed screw joint for connecting the parts, said screw joint consisting of an elongated screw member engaged in the openings in said parts and having a first portion axially securing said screw member in one of said parts in at least one direction and having a threaded second portion axially spaced from said first portion, a nut member engageable with said second portion for axial takeup against the other part, means defining a central axial bore in said screw member having an opening at the axial end thereof receiving said nut member and terminating in a bottom wall adjacent said first portion of said screw member, a piston rod mounted in said bore and means securing said piston to said screw member adjacent the opening end of said bore, said piston rod extending into said bore with the lower axial end face thereof spaced closely adjacent said bottom wall of said bore, and located closely adjacent the connection of said screw member in said one part, the major portion of the outer peripheral surface of said piston rod extending axially from a first plane transverse to its axis below its connection to said screw member to a second transverse plane adjacent its lower end face being radially spaced from said bore to provide an annular space therebetween and a means defining an axial channel in said piston rod for conveying a pressure medium into the space defined by the axial end face of said piston rod and the bottom wall of said bore thereby to effect axial expansion of said screw member, and sealing means between the lower end of said piston rod and the wall of said, the outer peripheral surface of said screw member confronting the surface defining the opening in said other part being spaced therefrom to permit free axial expansion of said screw member upon pressurization of said space.

3,886,708
APPARATUS FOR SEALING CONTAINERS

Otto Guse, Viersen, Germany, assignor to Robert Bosch Verpackungsmaschinen G.m.b.H., Waiblingen, Germany

Filed May 3, 1974, Ser. No. 466,794
Claims priority, application Germany, May 7, 1973, 2322947
Int. Cl.[2] B65B 7/28, 51/14
U.S. Cl. 53—329 3 Claims



1. An apparatus for sealing lids on containers made, at least partially, of thermoplastic material comprising, in combination:

a. a plurality of welding units, each welding unit including one heated die and a holder for receiving a container sought to be sealed, and each said welding unit being spaced from adjacent welding units by at least a given distance measured between corresponding points on these welding units;

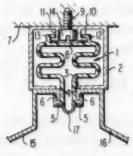
b. endless conveyor means for supporting and moving said welding units in sequence through a welding station while maintaining substantially spacing between adjacent ones of said welding units; and

c. fixed cam means in said welding station, a portion of said cam means being arranged to cause mutual compression between each one of said heated dies and a corresponding one of said holders so as to press a lid on a container as each welding unit passes through said welding station, and said portion of said cam means being shorter in length than said given distance between adjacent ones of said welding units.

3,886,709
WALL FACING ARRANGEMENT

Robert Krah, Troisdorf-Sieglar, and Alfons Gehrke, Cologne, both of Germany, assignors to Dynamit Nobel AG, Germany

Filed Sept. 25, 1972, Ser. No. 291,597
Claims priority, application Germany, Sept. 24, 1971, 2147907
Int. Cl. E04b 1/68
U.S. Cl. 52—460 28 Claims



1. A wall facing arrangement comprising:

at least one face panel having a facing surface extending generally parallel to a fixed building wall or the like, and mounting means for mounting said face panel to the fixed building wall or the like,

wherein said mounting means includes resilient means for providing a resilient interconnection between at least two opposed edge portions of said face panel and said wall such that substantial resilient movements of said face panel in the direction of said wall and in directions parallel to said wall are permitted,

wherein the resilient means includes sidewalls bent in a meander shape in cross-section at least along a part of their length, and

wherein the sidewalls have outwardly projecting ends which are resilient in the longitudinal direction.

3,886,710

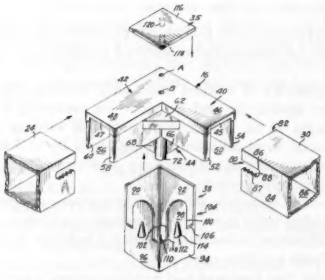
TABLE CONSTRUCTION

Franz Krause, East Port, and Austin T. Shulberg, Bright Waters, both of N.Y., assignors to Classic Games Company, Inc., Deer Park, N.Y.

Filed June 26, 1973, Ser. No. 373,653

Int. Cl. E04b *1/00*

U.S. Cl. 52—758 H **7 Claims**



1. Apparatus comprising a one-piece plastic connector, said connector including a first stub, a second stub and a third stub, said first stub intersecting with said second stub and being perpendicular to said second stub, said third stub extending away from the intersection of said first and second stubs, means extending between said first and second stubs for supporting a plate of material and for use in securing tubular rods to said first and second stubs, a first tubular rod, said first tubular rod having an elongated axis and a first end and a second end, a slot located at said first end of said first tubular rod, said first end of said first tubular rod tightly surrounding said first stub with said extending means partially received in said slot.

3,886,711

METHOD FOR FORMING CAULKING TUBE CARTRIDGES

Don R. Brothers, Canfield, and Edwin D. Stewart, Austintown, both of Ohio, assignors to Century Industries Corporation, New Waterford, Ohio

Filed June 12, 1974, Ser. No. 478,443

Int. Cl. B65b *7/28, 3/00*

U.S. Cl. 53—14 **2 Claims**

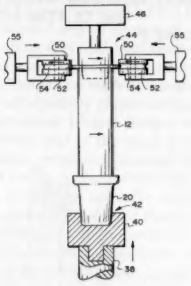
1. A method for forming a caulking cartridge of the type including a cylindrical body which holds the caulking material and having a nozzle end and a piston end, comprising the steps of:

a. providing a generally cylindrical rotatable anvil member adapted to be closely received within the piston end of the caulking cartridge;

b. providing a flange ring member including a cylindrical open-ended section having a flange extending radially outwardly from one end thereof;

c. providing a protective cap adapted to snap on the nozzle end of the caulking tube;

d. positioning the cylindrical open-ended section of the flange ring member in the piston end of the cartridge with the flange overlying the end edge of the body and axially aligning the cap with the cartridge; and,



e. axially aligning the piston end of the cartridge with the anvil and applying sufficient axial force to move the anvil into the piston end of the cartridge to cause the cap to snap onto the nozzle end of the body and rotating the body and the anvil relative to a deforming means and deforming the flange with said means into a bead about the piston end of the cartridge.

3,886,712

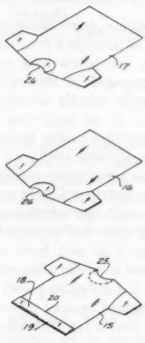
METHOD OF PACKAGING T-SHIRTS

John D. Sylvester, Garden City, N.Y., assignor to Amscomatic Inc., Long Island City, N.Y.

Filed Aug. 9, 1974, Ser. No. 495,988

Int. Cl. B65b *63/04*

U.S. Cl. 53—21 FW **5 Claims**



1. A method of packaging three T-shirts in a single container comprising the steps of:

a. laying out a first and a second of the shirts superposed in flat condition and in registry, the front of the first shirt facing away from the second shirt,

b. folding the bottom part of a third shirt upon itself along a line parallel to the bottom edge of the shirt,

c. placing the three shirts in superposed relation with the longitudinal axes of all the shirts parallel, the third shirt being against the second shirt and the fold line of the third shirt being adjacent to the collar of the second shirt,

d. placing a stiffener board against the exposed face of the shirt farthest from the first shirt,

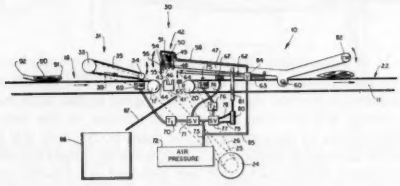
e. folding over the stiffener board the bottoms of the first and second shirts, the top of the third shirt, and the sides of all the shirts,
f. then folding the tops of the first and second shirts and the bottom of the third shirt over the stiffener board, and
g. inserting the folded shirts as a unit into a container.

3,886,713

BAG CLOSING METHOD AND APPARATUS

William O. Mitchell, Vidalia; Charles S. Hamm, Covington, and Joseph David Williams, Winder, all of Ga., assignors to Oxford Industries, Inc., Atlanta, Ga.

Filed Oct. 16, 1973, Ser. No. 406,787
Int. Cl. B65b *1/24, 7/06*
U.S. Cl. 53—24 **9 Claims**



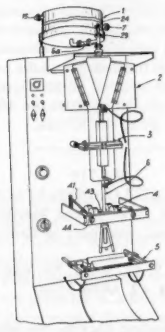
9. A method of closing the open end of a bag about a garment or the like comprising moving an open bag with a garment therein along a horizontal path with the open end of the bag following the garment, detecting the movement of the garment past a predetermined position along the path, gripping the bag at a first position on the bag behind the garment in response to the detection of the garment, and closing the bag at a second position on the bag behind the garment in response to the gripping of the bag.

3,886,714

MACHINE FOR MAKING AND FILLING SACHETS

Roland de la Poype, Paris, France, assignor to Prepac (S.A.R.L.), Villejuif, France

Filed July 11, 1974, Ser. No. 487,799
Claims priority, application France, Aug. 13, 1973, 73.29661
Int. Cl. B65b *9/12*
U.S. Cl. 53—180 **7 Claims**



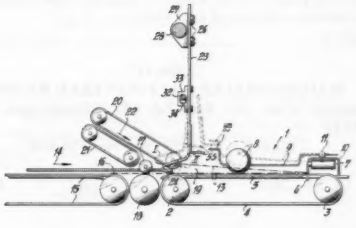
1. A machine for making and filling sachets, produced from at least one strip of suitable material, comprising a frame which supports an upper reservoir, a delivery pipe extending downwards from the reservoir, at least one longitudinal welding press arranged to form a tubular sheath from the strip, sheath-feeding rollers driven rotationally and arranged to grip and feed the sheath downwardly, the said rollers being mounted on the frame below the longitudinal welding press, and a transverse welding press mounted on the frame below the rollers, wherein the upper reservoir is of known constant level kind, wherein the delivery pipe is provided at its lower end with a valve seat and a valve associated with the seat is mounted on a rod which extends longitudinally inside the pipe and is adjustable in position in the longitudinal direction in relation to the pipe and wherein a cam-shaft supported by the frame is driven rotationally by a single motor and is provided with three cams arranged respectively mechanically to control the operation of the longitudinal welding press, the sheath-feeding rollers, and the transverse welding press.

3,886,715

ENVELOPE STUFFING MACHINE

Wilfried Dorer, Robberg, Germany, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Feb. 14, 1974, Ser. No. 442,470
Claims priority, application Germany, Apr. 26, 1973, 2321129
Int. Cl. B65b *43/26*
U.S. Cl. 53—384 **7 Claims**



1. Apparatus for opening and holding open the mouth of an envelope at a filling station of an envelope stuffing machine, comprising:
an envelope feed path for feeding said envelope along a predetermined plane to said filling station;
a pair of pivotable arms disposed in a generally normal direction to said envelope feed path, said arms being equipped with a hook-shaped spreading member;
means for supporting said arms in spaced apart parallel relation on first and second support means extending transversely of said arms, said first support means defining a pivoting axis for said arms;
support mounting means on said first and second support means permitting displacement of the arms in a vertical direction relative to said predetermined plane; and
drive means for intermittently imparting rotary motion to said second support means causing said spreading members to move on a generally circular path from a rest position clear of the mouth of the envelope and into an operative position holding open the mouth of said envelope and returning to said rest position after said envelope had been stuffed.

3,886,716

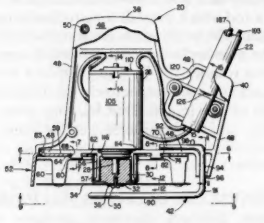
ELECTRICALLY POWERED GRASS TRIMMER

Jerry W. Sellers, Lexington, Tenn., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Feb. 26, 1973, Ser. No. 335,928
Int. Cl. A01d *35/26;* **A01g** *3/06*
U.S. Cl. 56—17.4 **8 Claims**

1. In an electrically powered grass trimmer, a split motor housing longitudinally divided into a pair of separately

formed, mating shells, means for securing said shells together, an electric motor mounted in said housing, a grass-cutting blade located below said housing and drive connected to said motor for rotation about a substantially vertical axis when the housing is in an upright position, an elongated member extending from said housing, handle means positioned on said



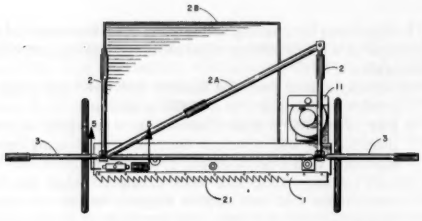
elongated member remote from said housing, and a support structure carried by said housing and having a portion underlying said blade and adapted to seat on the ground to limit the approach of said blade to ground, said structure being trapped at an end region between interior surfaces of said shells and secured in place only by separable seating surface engagement with interior surfaces of said shells.

3,886,717

MAN-PROPELLED, SELF-POWERED REAPER

Chester A. White, 813 Ram Trl. S.E., Albuquerque, N. Mex. 87123

Filed July 5, 1973, Ser. No. 376,608
Int. Cl. A01d *53/06*
U.S. Cl. 56—201 **8 Claims**



1. A man carried reaper for use in relatively small areas to harvest various types of grain, comprising:

a cutter-bar powered by an integrally mounted gasoline engine;

said cutter-bar being suspended at its end from vertical hangers of a support frame extending upward in a plane perpendicular to the normally horizontal plane of the cutter-bar;

the tops of the vertical hangers being attached to a top horizontal support member connecting the two hangers and extending outwardly therefrom so as to be carried by one man at each end of the reaper;

a rearwardly extending control handle attached near the top of each vertical hanger of the support frame, permitting either of the two men to control the position of the cutter-bar by rotating the cutter-bar about the longitudinal axis of the top horizontal support member; and

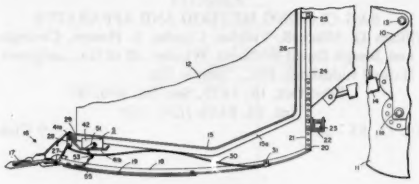
means for controlling the operation of the gasoline engine, said control means being mounted on one end of said top horizontal support member.

3,886,718

AUTOMATIC HEADER HEIGHT CONTROL SYSTEM FOR COMBINES AND THE LIKE

John M. Talbot, P.O. Box 9, Numa, Iowa 52544

Filed May 17, 1974, Ser. No. 470,921
Int. Cl. A01d *67/00*
U.S. Cl. 56—208 **15 Claims**



1. In an agricultural machine including a main body having means for transporting the body over agricultural terrain and an adjustable portion movable with respect to the main body for raising and lowering movements relative to the terrain independently of movement of the main body along the terrain, the adjustable portion including working means for operation closely above the terrain and disposed extensively along a direction transversely of that of the travel of the machine along the terrain, the working means depending from and being floatably connected to the adjustable portion for raising and lowering movements relative thereto between predetermined limits independently of said movements of the adjustable portion and the main body, and power means for effecting said movements of the adjustable portion, the power means having electrically activated control means for operating the same, the improvement comprising: a plurality of sensing means carried by one of the adjustable portion and the working means and spaced from each other along said transverse direction, the sensing means being responsive to the distance of the working means from the adjustable portion at selected points along said transverse direction and operable independently of each other, and an electrical and electronic control circuit electrically interconnecting each sensing means and the power control means for automatically activating the latter in response to signals provided by the sensing means, the sensing means having a first set of positions providing a first set of signals for activating the power control means to effect said raising movement of the adjustable portion in the event the distance of the working means at one of said selected points therealong is less than a predetermined minimum from the adjustable portion as the machine travels along the terrain, the sensing means having a second set of positions providing a second set of signals for activating the power control means to effect said lowering movement of the adjustable portion in the event the distance of the working means at all of a plurality of said selected points therealong is greater than a predetermined maximum from the adjustable portion as the machine travels along the terrain.

3,886,719

CONTINUOUS LOADING STACKER

Harold Keith Garrison, Newton, and Martin Eugene Pruitt, Hesston, both of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Dec. 5, 1973, Ser. No. 422,092
Int. Cl. A01d *85/00*
U.S. Cl. 56—344 **20 Claims**

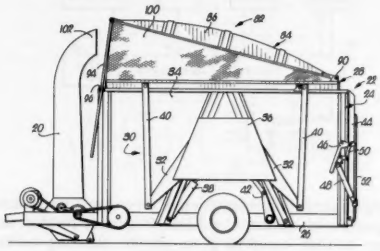
1. In a continuous loading-stacking machine, a

hollow, crop-receiving body having a lower, open top section provided with a bed and an upper, open bottom section provided with a roof;

apparatus operable continuously as the machine is advanced for picking up a crop off a field and feeding the same into the body while the upper section is raised,

said lower section being provided with means supporting the upper section for vertical reciprocation whereby, upon lowering of the upper section from time to time during continuous machine advancement, said roof thereof will move toward the bed against the crop collected in the body to compress said collected crop,

said roof being disposed for deposit of the crop thereupon during reciprocation of the upper section; and



structure carried by the roof thereabove for confining the crop on the roof during said reciprocation,

said roof having an opening communicating with the body and a gate closing the opening during feeding of the crop onto the roof,

there being means for opening the gate from time-to-time to discharge the accumulated crop from the roof into the body.

3,886,720

DEVICE FOR APPLYING FILAMENTARY MATERIAL ABOUT A WORKPIECE

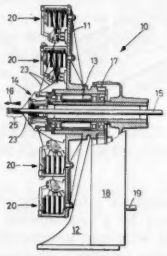
Max Ostermann, Wuppertal-Barmen, Germany, assignor to W. & M. Ostermann, Wuppertal, Germany

Filed Feb. 13, 1974, Ser. No. 442,125

Claims priority, application Germany, Feb. 16, 1973, 2307764

Int. Cl. B65h *81/08*

U.S. Cl. 57—13 **12 Claims**



1. In an apparatus for applying filamentary material to a workpiece, a combination comprising output means from which filamentary material is pulled off under tension to be applied to the workpiece; supply means carrying a supply of the filamentary material and being rotatable in response to withdrawal of such material which is being furnished to said output means; braking means displaceable between a first and a second operative mode in which it respectively permits and prevents rotation of said supply means and withdrawal of the filamentary material from the same, said braking means including a first roller about which said filamentary material is trained; loop-forming means including a second roller about which said filamentzry material is also trained and permanently tending to move with said second roller from an inoperative position to an operative position in which it forms a storage loop from a length of said filamentary material intermediate said output means and said supply means, said loop-forming means being responsive with movement to said operative position to a displacement of said braking means into said first mode and causing displacement of said braking means back into said second mode as a consequence of the formation of the loop, whereby said output means can withdraw filamentary material only from said loop until said length of filamentary material is used up and said loop-forming means is moved to said inoperative position; release means for displacing said braking means into said first mode in automatic response to movement of said loop-forming means toward said inoperative position; and preventing means for preventing contacting of said first and second rollers responsive of the relative positions assumed by the same.

3,886,721

METHOD FOR OVER-END WINDING OF YARNS

Kenneth Andrew Key, Abergavenny, and Clive William Hooper, Newport, both of England, assignors to Imperial Chemical Industries Limited, London, England

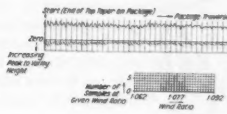
Division of Ser. No. 884,772, Dec. 23, 1969, abandoned, which is a continuation of Ser. No. 695,736, Jan. 4, 1968, abandoned.

This application May 30, 1973, Ser. No. 365,196

Claims priority, application United Kingdom, Jan. 17, 1967, 2476/67

Int. Cl. D01h *1/24, 1/02, 1/36*

U.S. Cl. 57—156 **5 Claims**



1. A process for producing a yarn package substantially free from ridges comprising winding the yarn into a package by means of a ring and traveller and spindle assembly with ring tilt of which the wave amplitude is greater than the traverse increment per revolution of the point of lay according to one or more values of at least substantially constant wind ratio calculated to avoid regions of patterning in the package and maintaining the wind ratio programme at least during a part of the winding, said wind ratio being obtained by continuously monitoring traveller speed, deriving an electrical signal from said monitored traveller speed, and regulating a parameter of said process by means of said electrical signals.

3,886,722

PROCESS FOR PRODUCING POLYESTER TEXTURED YARN

Kikuo Hori; Hidehiko Okada, and Masakazu Fujita, all of Matsuyama, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Aug. 13, 1973, Ser. No. 387,629

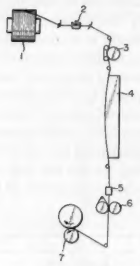
Claims priority, application Japan, Aug. 17, 1972, 47-81782

Int. Cl. D02g *1/00*

U.S. Cl. 57—157 TS **17 Claims**

1. A process for producing a polyester textured yarn which comprises drawing and simultaneously false-twisting an undrawn polyester yarn using a draw texturing apparatus equipped with a heat-treating heater and a false twister between feed rollers and draw rollers, wherein the undrawn polyester yarn has a birefringence (Δn) of 0.01 to 0.05, and the draw ratio (DR) is adjusted to a value expressed by the following equations according to the birefringence of the undrawn polyester yarn

$-1.8349 \log \Delta n - 1.1376 \leq DR \leq -2.1789 \log \Delta n - 1.3509$



and

$DR \leq 2.8$.

3,886,723

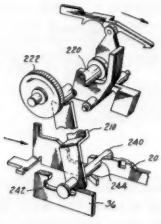
ALARM CLOCK TIMER

Robert L. Boyles, Wayland, Mass., assignor to General Electric Company, Bridgeport, Conn.

Division of Ser. No. 388,770, Aug. 16, 1973. This application June 21, 1974, Ser. No. 481,883

Int. Cl. G04b *23/06*

U.S. Cl. 58—21.15 **5 Claims**



1. An automatic alarm clock mechanism comprising:

a. an alarm vibrator arm;

b. a vibrator shutoff lever having an alarm on position out of engagement with said vibrator arm and an alarm off position in engagement with said vibrator arm;

c. an automatic alarm shutoff lever pivotally coupled to on said vibrator shutoff lever;

d. a member rotated as a function of time; and

e. a drive member eccentrically positioned on said member rotated as a function of time and movable into engagement with said automatic alarm shutoff lever for automatically moving the automatic alarm shutoff lever and the vibrator shutoff lever to an off position.

3,886,724

LIQUID CRYSTAL DISPLAY WATCH

Masaaki Kamiya, Matsudo, Japan, assignor to Kabushiki Kaisha Diani Seikosha, Japan

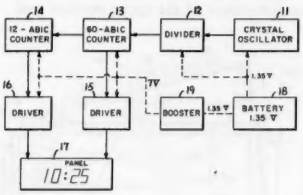
Filed Feb. 19, 1974, Ser. No. 443,185

Claims priority, application Japan, Feb. 23, 1973, 48-23354

Int. Cl. G04c *3/00;* **G04b** *19/30;* **H02j** *3/10*

U.S. Cl. 58—23 BA **4 Claims**

1. An electronic timepiece circuit comprising, an oscillator having a given frequency output, a frequency divider dividing the output of said oscillator, a divide-by-60 counter which counts modulo 60 counting output pulses of said frequency divider corresponding to minutes, a divide-by-12 counter which counts modulo 12 in series with the first-mentioned counter counting pulses corresponding to hours, a first driver connected to receive the output of the second-mentioned counter, a second driver connected to receive the output of the first-mentioned counter, a display panel displaying the output of said first driver as a digital output representation of time in hours, and displaying the output of the second driver



as a digital output representation of time in minutes, a battery energizing said oscillator and said frequency divider, and a voltage booster comprising an astable blocking oscillator connected to said battery for boosting the output of said battery and applying it to both of said counters and both of said drivers.

3,886,725

DIGITAL TIMEPIECE

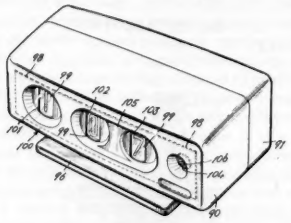
Masao Izawa; Kiyoto Ohlawa, both of Sakaki-machi, and Yookichi Yuasa, Tokura, all of Japan, assignors to Agatsuma Seiki K. K., Japan

Filed Nov. 20, 1973, Ser. No. 417,493

Claims priority, application Japan, Nov. 24, 1972, 47-134554; June 1, 1973, 48-63945; July 6, 1973, 48-79800

Int. Cl. G04b *19/30, 19/02*

U.S. Cl. 58—50 R **10 Claims**

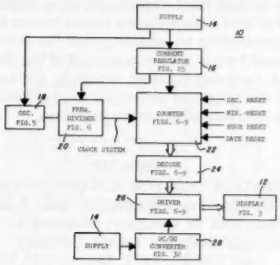


1. A digital timepiece comprising an intermediate gear rotated continuously by a synchronous motor, an engaging protrusion integral with said intermediate gear, a series of intermittently rotative members arranged on a first plate and actuated in successive order and intermittently by said engaging protrusion, at least three rotary drums mounted on said intermittently rotative members, a plurality of light sources arranged on a second plate and positioned in each said rotary drum, and a cover enclosing and holding said motor, intermittently rotative members, rotary drums and light sources, said rotary drums being adapted to display characters for single digit of minute indications, two digits of minute indications and hour indications, said characters being formed of light-transmitting material, said covering being provided with a plurality of opening for displaying an indication unit of each of said rotary drums, and the light rays emitted from said light sources being emitted directly toward the outside through the characters of said light-transmitting construction and the openings of the covering.

3,886,726
ELECTRONIC TIME KEEPING SYSTEM

Clark R. Williams, and Robert H. Schnurr, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed June 19, 1972, Ser. No. 264,212
Int. Cl. G04b *19/30, 11/24, 27/00*
U.S. Cl. 58—50 R **6 Claims**



1. A battery operated electronic timekeeping device comprising in combination:

a. current regulator means for producing constant current from a battery voltage source on the order of 1 volt;

b. a frequency source;

c. first circuit means coupled to said frequency source for providing a system clock signal;

d. logic means including counter means responsive to said system clock signal and operative to provide time data, said counter means being implemented by current driven bipolar integrated circuitry coupled to and driven by said current regulator means;

e. display means having a plurality of display elements for respectively displaying time data, and

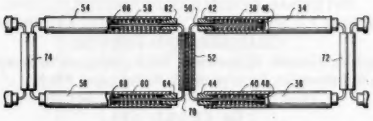
f. voltage drive circuit means coupled to said display means and said logic means, said voltage drive circuit means being operable to impress drive voltages across said display in accordance with said time data.

g. time setting means coupled to the logic means for setting the status of the respective display elements independently of the other elements.

3,886,727
EXPANDABLE BELT

Richard Bower, 3708 Crownridge Dr., Sherman Oaks, Calif. 91403

Filed Sept. 4, 1973, Ser. No. 394,322
Int. Cl. F16g *13/24*
U.S. Cl. 59—79 B **9 Claims**

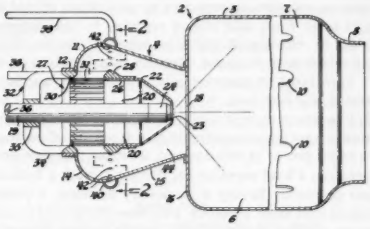


1. An expandable belt comprising a plurality of tubing, a collar adapted to attach to said tubing, a chain passing through a hole in the collar, a spring in said tubing held by an eyelet attached to the end of the chain, a connector adapted to receive said chain, and said tubing is threaded internally and said collar is threaded externally.

3,886,728
COMBUSTOR PRECHAMBER

Ronald E. Quinn, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed May 1, 1974, Ser. No. 465,754
Int. Cl. F02c *3/00, 7/22*
U.S. Cl. 60—39.23 **4 Claims**

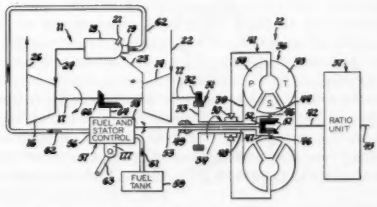


1. A combustion liner for a gas turbine combustion apparatus or the like comprising a wall extending from an upstream end to a downstream end of the liner defining, in flow sequence, a prechamber, a reaction zone, a dilution zone, and an outlet for combustion products, the prechamber wall having a substantially circular cross section; means for delivering fuel to the inner surface of the prechamber wall; means defining an annular radial outflow air inlet at the upstream end of the prechamber, the air inlet extending circumferentially and axially of the prechamber upstream of the fuel delivering means; an air swirling and throttling cylinder disposed across the said air inlet movable axially of the prechamber, the cylinder bearing a set of swirl vanes adapted to direct the air outwardly and circumferentially from the inlet into the prechamber, the area of the set of swirl vanes being variable by axial movement of the cylinder to vary primary air flow into the liner.

3,886,729
GAS TURBINE WITH THROTTLE RESPONSIVE HYDROKINETIC TORQUE CONVERTER AND THROTTLE RESPONSIVE HYDROKINETIC TORQUE CONVERTER

Charles A. Amann, Bloomfield Hills, and David C. Sheridan, Utica, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 30, 1973, Ser. No. 392,855
Int. Cl. F02d *9/02;* **F16d** *33/04*
U.S. Cl. 60—39.24 **19 Claims**



1. In a power train; an input member providing an input drive adapted to be driven by an engine; a load member for driving a load; a hydrokinetic torque converter having a stationary housing, a pump connected to said input member, a turbine connected to said load member, a stator and variable capacity means movable from a full rated power capacity position through a range of positions including an intermediate power capacity position to a closed minimum power capacity position operative to provide variable power capacity drive to the turbine; a throttle control means having a throttle

lever movable from a closed position through a first range of movement to an intermediate position for providing idle speed fuel feed for engine variable power and from intermediate position through a second range of movement for providing increasing fuel feed to full rated engine power position to provide input member power increasing as a function of input member speed; and capacity control means operatively connected to said variable capacity means and said throttle control means operative in response to movement of said throttle control lever from said closed position to said intermediate position to move said variable capacity means from said closed position to increase capacity as a function of throttle lever movement to increase idle speed power capacity with increased idle fuel feed.

12. In a power train; a single shaft gas turbine engine providing power varying as a variable rate function of engine speed up to rated power at rated speed, an input member driven by said engine; a load member for driving a load; a hydrokinetic torque converter having a stationary housing, a pump connected to said input member, a turbine connected to said load member, a stator and variable capacity means movable from full power capacity position through a range of positions to a minimum power capacity position; throttle control means connected to said engine having a throttle lever movable from a closed position through a first range of movement to an intermediate position providing idle speed fuel feed for maintaining idle speed with increased power for said engine throughout the first range of movement and movable from intermediate position through a second range of movement providing increasing fuel feed to full rated power at rated speed at full throttle; and capacity control means operatively connected to said variable capacity means, and said throttle control means operative in response to movement of said throttle lever from said closed position to said intermediate position to move said variable capacity means from said closed position to said intermediate position as a function of throttle movement to provide increased idle speed power capacity and substantially equally increased idle speed engine power.

3,886,730

GOVERNING DEVICE FOR A GAS TURBINE SYSTEM

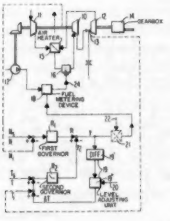
Christian Greune, Furstenfeldbruck; Friedrich Hackl, Neu-Esting, and Karl Maier, Munich, all of Germany, assignors to Motoren-und Turbinen-Union Munich GmbH, Germany

Filed Dec. 21, 1972, Ser. No. 317,306

Claims priority, application Germany, Dec. 21, 1971, 2163344

Int. Cl. F02c *9/08*

U.S. Cl. 60—39.28 R **11 Claims**



1. In a gas turbine system including a combustion chamber receiving combustion air from a turbine driven compressor and a fuel metering device for metering the flow of fuel to said combustion chamber, a governing arrangement for controlling said fuel metering device comprising first governor means responsive to a first engine operating characteristic for generating a first control signal, a sensor having an inherent response delay for sensing a second engine operating characteristic, second governor means connected to said sensor for generating an adjusting signal, logic means responsive to the first control signal and the adjusting signal for providing an output fuel flow control signal for application to said fuel metering device, and control means responsive to variations in said output fuel flow control signal and a signal representing a third engine operating characteristic for automatically controlling said second governor means to compensate for the inherent response delay of said sensor, said control means including a differentiating circuit means for differentiating the output fuel flow control signal, signal level adjusting means responsive to said third engine operating characteristic and the output of said differentiating circuit means for generating a signal representing an additive value for the value insufficiently sensed by said sensor as a result of the response delay, and a first summing junction receiving the output of said sensor and the output of said signal level adjusting means for controlling said second governor or means.

3,886,731

GOVERNING DEVICE FOR A GAS TURBINE SYSTEM

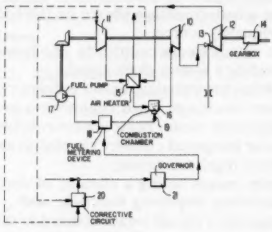
Christian Greune, Furstenfeldbruck, and Friedrich Hackl, Neu-Esting, both of Germany, assignors to Motoren-und Turbinen-Union Munchen GmbH, Germany

Filed Dec. 22, 1972, Ser. No. 317,776

Claims priority, application Germany, Dec. 22, 1971, 2163804

Int. Cl. F02c *9/08*

U.S. Cl. 60—39.28 T **8 Claims**



1. A governing system for controlling the fuel flow to a gas turbine engine having a combustion chamber receiving compressed air from a compressor and fuel from a fuel metering device, comprising a governor providing a control signal to control said fuel metering device, means for generating a speed correction signal at constant turbine speed or power lever angle in response to the related values of engine speed and temperature at the inlet of said compressor, and a summing junction for summing said speed correction signal and a desired speed signal, the output of said summing junction being applied in control of said governor at constant turbine speed or power lever angle.

3,886,732

INTERNAL COMBUSTION ENGINE HAVING COAXIALLY MOUNTED COMPRESSOR COMBUSTION CHAMBER, AND TURBINE

Joseph A. Gamell, Kalamazoo, Mich., assignor to Joseph Gamell Industries, Incorporated, Kalamazoo, Mich.

Filed Sept. 27, 1973, Ser. No. 401,206

Int. Cl. F02c *3/14*

U.S. Cl. 60—39.35 R **4 Claims**

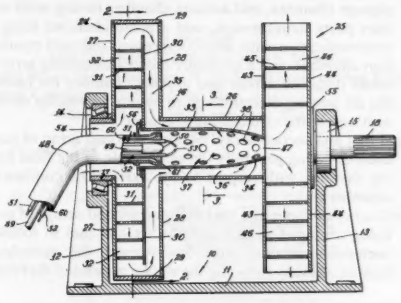
1. An internal combustion engine of the turbine type comprising in combination:

1. a support,
2. an integral rotor combination rotatably mounted on said support, said rotor combination comprising:
   a. A compressor comprising a first outer radial wall, a second outer radial wall, a peripheral axial wall con-

necting said first and second outer radial walls, and an inner radial wall mounted intermediate said first and second outer radial walls and of smaller diameter than said outer radial walls, and a spiral web intermediate said first outer wall and said inner wall having its edges affixed to said walls, cooperating to define a spiral chamber,

b. a turbine having a power shaft operatively connected thereto,

c. a tubular housing connected at one end to said compressor and at the other end to said turbine, said inner



radial wall and said second outer radial wall of said compressor cooperating to define a radial duct communicating with said tubular housing,

d. means defining a combustion chamber within said tubular housing, said compressor, said turbine, said tubular housing and said combustion chamber all being coaxially mounted, and

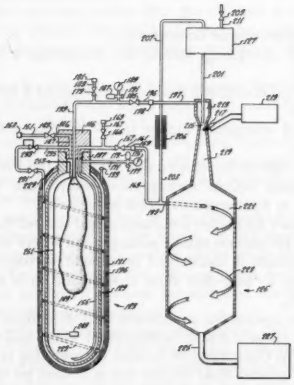
3. a fuel duct mounted on said support extending through the axis of said compressor and having a fuel supply jet at the end thereof for supplying fuel to said combustion chamber.

3,886,733

PNEUMATIC ENERGY SOURCE UTILIZING LIQUID OXYGEN

Joseph A. Connell, Fountain Valley, Calif., assignor to NRG Incorporated, Phoenix, Ariz.

Filed Aug. 24, 1973, Ser. No. 391,233
Int. Cl. F02g *3/00;* **F17c** *7/02*
U.S. Cl. 60—39.48 **20 Claims**



1. Apparatus for producing pneumatic power, comprising:

an insulated vessel, comprising:

a first container for storing liquified inert gas at an elevated pressure; and

a second container within said first container for storing liquified oxygen, said second container permitting heat flow from said liquified oxygen to said liquified inert gas when a temperature differential exists therebetween, said second container including means for applying said elevated pressure of said liquified inert gas to said liquified oxygen to pump said liquified oxygen from said second container;

means for storing a hydrocarbon fuel; and

a combustion chamber fluidly connected to said storing means and said insulated vessel comprising:

means for combining said liquified oxygen with said hydrocarbon fuel to produce a high temperature flame; and

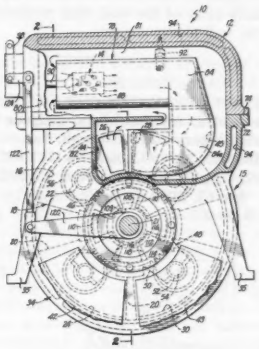
means for injecting said liquified inert gas into said high temperature flame.

3,886,734

CONTINUOUS COMBUSTION ENGINE

Richard G. Johnson, 2611 W. Ave. N.-12, Palmdale, Calif. 93550

Filed May 23, 1973, Ser. No. 363,030
Int. Cl. F02g *3/00*
U.S. Cl. 60—39.61 **9 Claims**



1. A continuous combustion engine comprising:

a combustion chamber containing a fuel burner,

a housing, a rotary shaft supported in said housing, an annular power cylinder in said housing about said shaft, pistons in and movable around said cylinder and defining with the cylinder working chambers between the adjacent pistons, and means connecting said pistons, housing, and shaft for effecting reciprocating motion of said pistons in timed relation during movement of said pistons around said cylinder in a manner such that said working chambers undergo alternate expansion and contraction during their movement around said cylinder with said pistons and that said shaft is rotated by movement of said pistons around said cylinder, and

valving means for effecting admission of air to each working chamber through an intake phase for compression of said air and transfer of the compressed air to said combustion chamber through a port in said housing during contraction of the working chamber for heating through a transfer phase by fuel combustion of the air in said combustion chamber to produce a hot pressurized working fluid, transfer of said working fluid to the working chamber through a port in said housing during expansion thereof through a power phase to drive said pistons around said cylinder and thereby said shaft in rotation, and exhausting

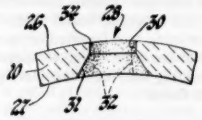
of the spent working fluid from the working chamber through an exhaust phase.

3,886,735

CERAMIC COMBUSTION LINER

John A. Irwin, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 1, 1974, Ser. No. 456,602
Int. Cl. F02c *1/00*; F23d *15/00*
U.S. Cl. 60—39.65 11 Claims



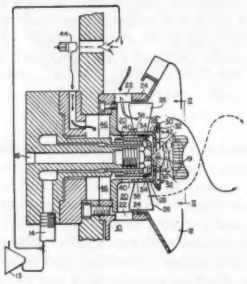
1. A combustion apparatus comprising a combustion liner defining a space for combustion of fuel, the liner having a wall of ceramic material defining the exterior of the liner and defining ports for admission of air into the liner, the air being significantly cooler than the liner in normal operation of the combustion apparatus, and means for reducing thermal stresses in the wall due to local cooling of the wall by air streams entering through the ports providing a barrier contracting the entrance to the ports so that the air streams remain substantially clear of the wall, thus minimizing transfer of heat from the wall to the streams.

3,886,736

COMBUSTION APPARATUS FOR GAS TURBINE

Katsuyuki Kawaguchi, Akashi, Japan, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 31, 1973, Ser. No. 411,497
Claims priority, application Japan, Nov. 9, 1972, 47-111619
Int. Cl. B05b *7/10*; F02c *3/00*
U.S. Cl. 60—39.74 R 4 Claims



1. A combustion apparatus for a gas turbine having a combustion chamber, a fuel supply, a compressor to supply a pressurized air for combustion, a supply of pressurized atomizing fluid to atomize the fuel, said combustion apparatus comprising:

a fuel supply nozzle having at least one port in communication with said combustion chamber and disposed to direct the flow of fuel to said combustion chamber;

an atomizing fluid chamber having walls which define at least one duct disposed to direct atomizing fluid into said combustion chamber so that it converges with fuel flowing thereto;

a plenum chamber comprised of walls disposed about said atomizing fluid chamber;

a first array of angularly arranged ports disposed through said wall of said plenum chamber and disposed about said fuel nozzle, said first array of angularly arranged ports providing jets of air to promote vortecular motion to the fuel in said combustion chamber;

a frustoconical baffle having its small diameter edge attached to said walls of said plenum chamber, said baffle being annularly disposed about said nozzle;

a second array of angularly arranged ports disposed through said baffle about said fuel nozzle, said second array of angularly arranged ports providing jets of air to promote mixing and increase vortecular motion of the combustion components;

an arcuate chamber disposed radially outwardly of said plenum chamber, said arcuate chamber having walls with inlet ports therethrough, said arcuate chamber being in communication with said compressor and said combustion chamber, and a generally radially extending array of vanes disposed across said arcuate chamber for causing the air passing therethrough to have a vortecular motion as it enters the combustion chamber;

said first and second arrays of ports and said array of vanes each directing generally the same angle to the fluid passing thereby, with respect to the axis of the combustion chamber;

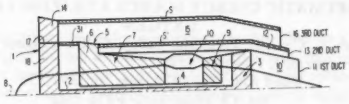
said array of vanes and said first and second arrays of ports being arranged as to cause the air and fuel to follow a vortecular motion, and to increase the turbulence therein, thereby reducing the smoke generated therewith.

3,886,737

TURBOJET ENGINES OF MULTI-SHAFT AND MULTI-FLOW CONSTRUCTION

Hubert Grieb, Unterpfaffenhofen, Germany, assignor to Motoren-und Turbinen-Union Munchen GmbH, Germany

Filed Aug. 22, 1973, Ser. No. 390,485
Claims priority, application Germany, Aug. 22, 1972, 2241283
Int. Cl. F02k *3/06*
U.S. Cl. 60—226 R 38 Claims



1. A turbojet engine comprising:

first fluid energizing means for energizing a first fluid stream,

second fluid energizing means for energizing a second fluid stream,

third fluid energizing means for energizing a third fluid stream,

first duct means for conducting said first fluid stream to a propulsion nozzle arrangement where said first fluid stream is discharged at a first jet velocity,

second duct means for conducting said second fluid stream to said propulsion nozzle arrangement where said second fluid stream is discharged in annular surrounding relationship to said first fluid stream and at a second jet velocity,

third duct means for conducting said third fluid stream to said propulsion nozzle arrangement where said third fluid stream is discharged in annular surrounding relationship to said second fluid stream and at a third jet velocity,

wherein said first jet velocity is greater than said second jet velocity and said second jet velocity is greater than said third jet velocity.

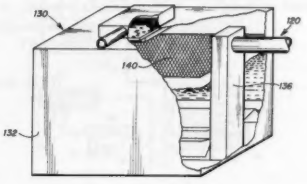
wherein said third fluid energizing means includes a radially outer portion of a first rotatable fan means arranged immediately upstream of inlet means to said third duct means, wherein said second fluid energizing means includes a second rotatable fan means arranged downstream of said first fan means and immediately upstream of inlet means of said second duct means, wherein flow into all of said duct means passes through said first fan means, wherein flow into only said first and second duct means passes through said second fan means, and wherein said first and second fan means operate at different rotational speeds with respect to one another.

3,886,738

DIESEL ENGINE FOR USE IN MINES

Gerald Bruce Sien, Carlsbad, N. Mex., assignor to Sien Equipment Company, Carlsbad, N. Mex.

Filed Apr. 23, 1973, Ser. No. 353,519
Int. Cl. F02b *75/10*
U.S. Cl. 60—277 **12 Claims**



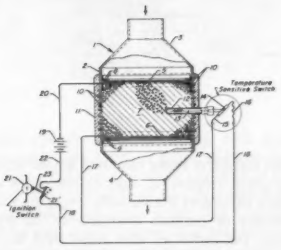
1. A diesel engine for use in mines which comprises:
an air filter for receiving intake air;
an intake flame arrester for receiving the air flowing from the air filter and comprising opposed bells adapted to clamp a flame arrester member therebetween;
an emergency air cut-off valve for receiving the air flowing from the intake flame arrester and adapted for selective manual actuation to terminate air flow into the engine;
an intake manifold for receiving the air flowing through the air filter, the intake flame arrester, and the emergency air cut-off valve and for directing the air to the cylinders of the engine;
an exhaust manifold for receiving exhaust gases from the cylinders of the engine;
means for directing cooling liquid through the exhaust manifold and thereby partially cooling the exhaust gases passing therethrough;
means for spraying water into the exhaust gases flowing from the exhaust manifold and thereby further cooling the exhaust gases by means of vaporization of the water spray;
a scrubber for receiving the exhaust gases flowing from the exhaust manifold and water vapor entrained therein, said scrubber comprising:
an enclosure for receiving a substantial quantity of water;
means for directing the exhaust gases and the water vapor entrained therein to a point beneath the surface of the water in the enclosure;
baffle means comprising inverted trough-shaped baffle members extending the length of the enclosure and mounted beneath the surface of the water in the enclosure for distributing the exhaust gases and the water vapor entrained therein beneath the surface of the water in the enclosure; and
water retainer means mounted within the enclosure above the surface of the water and comprising an expanded metal member extending substantially parallel to the bottom of the enclosure and throughout the entire length and width of the enclosure and throughout the entire length and width of the enclosure for removing entrained water vapor from the exhaust gases flowing from the scrubber, and
exhaust gas diffuser means comprising a horizontally disposed conduit having outlet holes formed through it at a plurality of axially spaced points for receiving the exhaust gases flowing from the scrubber and for discharging the exhaust gases to the surrounding atmosphere.

3,886,739

HEATING OF CATALYTIC CONVERTER CASING

Richard K. Lee, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 9, 1973, Ser. No. 414,583
Int. Cl. F01n *3/00, 3/14*
U.S. Cl. 60—286 **4 Claims**



1. In a combination of a catalytic converter and a control system therefor, said combination being utilized for effecting the conversion of an internal combustion engine exhaust gas stream passing through said catalytic converter, the improvement comprising, a converter housing having a wall portion surrounding a catalyst section therein, an electrical power source, a resistance heating means encompassing at least a part of said wall portion of said converter housing, said resistance heating means being in interconnection with said electrical power source, a temperature response means immersed in said catalyst section being responsive to the temperature therein, an ignition key means in interconnection with said engine for providing electrical power to said engine, a switch means in interconnection with said key means, said temperature responsive means and said electrical power source, said temperature responsive means actuating said switch means to thereby cut off said electrical power source to said resistance heating means at a predetermined temperature when the ignition key means provides power to said engine, and conversely closing said switch means to provide electrical power to said resistance heating means at a predetermined temperature when said ignition key means is deactuated and said engine is thereby deactuated, thereby to preclude rapid cooling of said converter housing and consequent compressive crushing action therefrom on the encompassed catalyst within said catalyst section after engine cut-off and while said catalyst is in a high temperature expanded state resultant upon ordinary engine operation.

3,886,740

HYDRODYNAMIC TORQUE CONVERTER WITH HYDRAULICALLY ENERGIZED ONE-WAY ROLLER CLUTCH

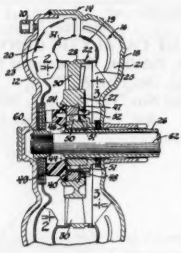
Frank S. Krok, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 17, 1974, Ser. No. 480,045
Int. Cl. F16d *33/00*
U.S. Cl. 60—341 **2 Claims**

1. In a hydraulic torque converter having a bladed pump and a bladed turbine discharging hydraulic fluid into the inlet of the bladed pump through a bladed stator operatively connected to a ground sleeve by a one-way roller clutch for pro-

viding torque multiplying and fluid coupling modes of operation, the improvement comprising:

a roller energizer for locating the rollers of said roller clutch at a position of incipient wedging engagement with the clutch races responsive to the flow of hydraulic fluid in said hydraulic torque converter during the operation thereof,



said roller energizer being mounted in said torque converter for rotation relative to said clutch races and having a plurality of fingers individually engaging said rollers and a plurality of paddles disposed in the hydraulic fluid between the outlet of said stator and the inlet of said pump.

3,886,741

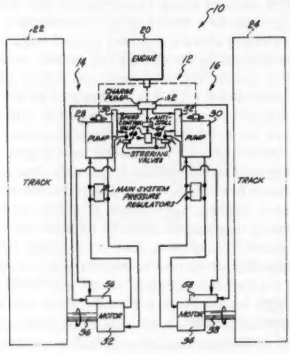
HYDROSTATIC TRANSMISSION ANTI-STALL SYSTEM

Harold R. Ward, Marshall, Mich., assignor to Eaton Corp., Cleveland, Ohio

Continuation-in-part of Ser. No. 356,720, May 3, 1973, abandoned. This application Mar. 13, 1974, Ser. No. 450,280

Int. Cl. F16h *39/46*

U.S. Cl. 60—431 **15 Claims**



1. An apparatus for controlling the operation of a hydrostatic transmission driven by a prime mover and having a variable displacement hydrostatic unit, said apparatus comprising motor means for varying the displacement of the hydrostatic unit and the output speed of the hydrostatic transmission, anti-stall means for effecting operation of said motor means to vary the displacement of the hydrostatic transmission upon the occurrence of an impending overloading of the prime mover, and rate control means for retarding operation of said anti-stall means in response to a rapid increase in the loading of the prime mover.

3,886,742

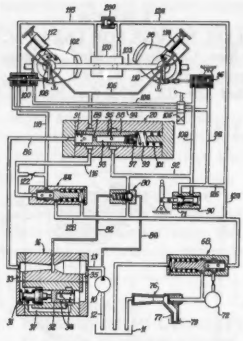
SINGLE PUMP HYDROSTATIC TRANSMISSION CONTROL AND SUPPLY SYSTEM

Gordon W. Johnson, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 427,087, Dec. 12, 1973. This application Sept. 20, 1974, Ser. No. 507,759

Int. Cl. F15b *11/02*

U.S. Cl. 60—488 **4 Claims**



1. A supply and control system for a hydrostatic transmission including; a source of fluid under pressure, flow control valve means for providing a constant volumetric rate of fluid flow, first fluid communication means between said source and said flow control valve means, speed control valve means for regulating the flow of fluid from said constant volumetric rate of flow provided by said flow control valve means to speed control means of said hydrostatic transmission, second fluid communication means between said speed control valve means and said flow control valve means, and third fluid communication means between said speed control valve means and said speed control means of said transmission.

3,886,743

HOT-GAS RECIPROCATING ENGINE AND CONTROL DEVICE

Jacobus Hubertus Abrahams, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 307,998, Nov. 20, 1972. This application Nov. 23, 1973, Ser. No. 418,297

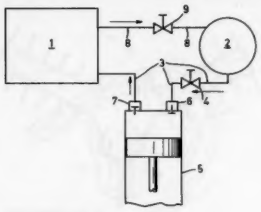
Claims priority, application Netherlands, Dec. 2, 1971, 7116550

Int. Cl. F03g *7/06*

U.S. Cl. 60—521 **4 Claims**

1. In a hot-gas engine operable with a working medium and including a working space, the improvement in combination therewith of means for controlling the quantity by weight of working medium in the working space, comprising a storage container for working medium, a compressor with a low pressure inlet and a high-pressure outlet, first and second ducts communicating said storage container with said working space, and first and second controllable valve means respectively in said ducts, said first duct means communicating said

storage container via said first valve with said compressor inlet, and communicating said compressor outlet with said



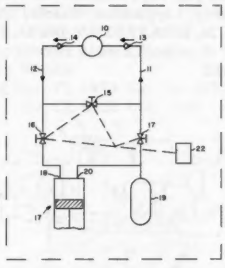
working space, and said second duct means communicating said container via said second valve with said working space.

3,886,744

POWER-CONTROL SYSTEM FOR STIRLING ENGINES

Hendrik A. Jaspers, Ossining, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed July 22, 1974, Ser. No. 490,728
Int. Cl. F03g *7/06*
U.S. Cl. 60—521 **8 Claims**



1. In a Stirling engine which includes a working space where a working gas is cycled between high and low pressures, the improvement in combination therewith of a power regulating system comprising a storage container with a bellows therein separating first and second chambers, the first chamber containing working gas, the second chamber containing a binary liquid-vapor mixture, the power-regulating system further comprising a supply conduit for conducting gas from said first chamber to said working space, and a dump conduit for discharging gas from said working space to said first chamber, and valve means for selectively regulating said gas flows in said supply and dump conduits, said gas in the first chamber being maintained at a substantially constant pressure since said mixture in the second chamber will vaporize and condense respectively according to the decrease or increase of gas in the first chamber.

3,886,745

HYDRAULIC ACTUATING DEVICE

Fukumi Kaida; Risaburo Nonaka, both of Kawagoe; Takeo Sugii, Tokyo, and Tetsuo Haraikawa, Funabashi, all of Japan, assignors to Tokico Ltd., Fujimi and Nippon Oils and Fats Co. Ltd., Tokyo, both of, Japan

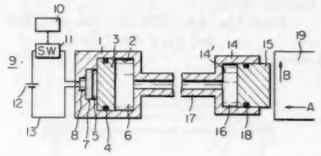
Filed Dec. 21, 1973, Ser. No. 427,104
Claims priority, application Japan, Dec. 27, 1972, 48-584
Int. Cl. F15b *13/04*
U.S. Cl. 60—533 **3 Claims**

1. A hydraulic actuating device, comprising:

a gas generating means having a first piston reciprocally slidable in a fluid tight relation therein, said means having a first chamber adjacent to the piston on one side thereof, a predetermined amount of self-combustible material in said chamber, and an igniting means therefor in igniting relationship with said material;

detecting means for detecting an emergency condition, and an electric circuit to which said detecting means is connected and connected to said igniting means for issuing an igniting signal to said igniting means upon detection of an emergency condition by said detecting means;

said gas generating means having a second chamber on the other side of said piston;



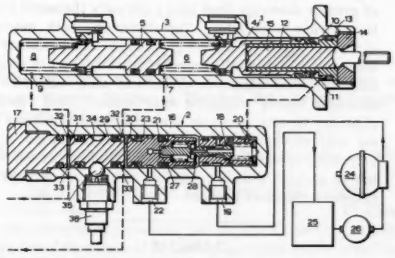
an actuating cylinder communicating with said second chamber and having a second piston slidable therein, with a liquid filling the space between one side of said second piston and said other side of said first piston in said gas generating means; whereby, when said igniting means is actuated by said signal transmitting means to ignite said self-combustible material, gas pressure produced thereby is applied to said first piston on said one side thereof, thus exerting pressure on the liquid on said other side of the first piston which is transmitted to the actuating cylinder to actuate said second piston.

3,886,746

POWER ASSISTED MASTER CYLINDER ASSEMBLIES

Glyn Phillip Reginald Farr, Kenilworth, England, assignor to Girling Limited, Birmingham, England

Filed Nov. 28, 1973, Ser. No. 419,662
Claims priority, application United Kingdom, Nov. 30, 1972, 55397/72; Feb. 20, 1973, 8177/73
Int. Cl. F15b *15/18;* **B60f** *17/06;* **B60r** *25/08*
U.S. Cl. 60—547 **5 Claims**



1. A power-assisted master cylinder assembly comprising a master cylinder which includes a cylinder body, a primary and a secondary piston arranged in tandem in said body, a primary and a secondary pressure space being defined ahead of said primary and said secondary piston respectively, an outlet from each of said pressure spaces for connection to a primary and secondary brake circuit respectively, a power chamber in said cylinder body behind said primary piston and an inlet to said power chamber for connection to a source of fluid under pressure; and a control valve assembly which includes valve means for controlling the supply of fluid from said source to said power chamber, and means for operating said valve

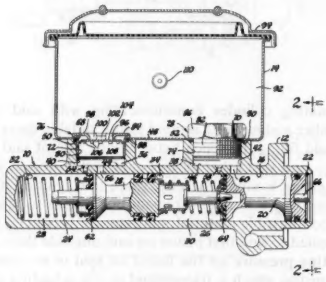
means in response to three conditions; firstly to pressure in both of said primary and secondary pressure spaces when both brake circuits are operational, secondly to pressure in said secondary pressure space in the event of a failure of said primary circuit, and thirdly to pressure in said primary space in the event of a failure of said secondary circuit.

3,886,747

MASTER CYLINDER ASSEMBLY AND RESERVOIR FOR SAME

Duane H. Harwick, Kettering, and Dwight W. McDaniel, Trotwood, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 19, 1974, Ser. No. 462,355
Int. Cl. F15b *7/08*
U.S. Cl. 60—585 **2 Claims**



1. A master cylinder reservoir arrangement comprising:
a master cylinder body having a first fluid reservoir chamber formed therein with an open top, a bottom provided with a compensation port, and a cylindrical side wall having an internally threaded section adjacent the open top;
a main fluid reservoir body defining a second fluid reservoir chamber having a side wall and a removable sealing top and a bottom, said bottom having an aperture therein positioned over said first fluid reservoir chamber and being at least as large as said first fluid reservoir chamber open top;
and means securing said main fluid reservoir body to said master cylinder body comprising a tubular member having an externally threaded section and a standpipe section of greater diameter than said externally threaded section to provide a shoulder therebetween, said externally threaded section extending through said aperture and threaded into said internally threaded section of said first fluid reservoir chamber cylindrical side wall with said shoulder tightly engaging said second fluid reservoir chamber bottom to retain said main fluid reservoir body on said master cylinder body, said standpipe section extending upwardly into said second fluid reservoir chamber to provide a dam extending above said second fluid reservoir chamber bottom.

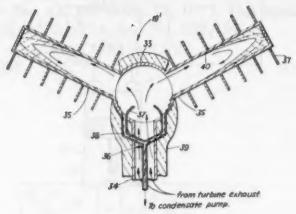
3,886,748

CLOSED RANKINE CYCLE POWER PLANT AND CONDENSER THEREFOR

Lucien Yehuda Bronicki, Rehovoth, Israel, assignor to Ormat Turbines (1965) Ltd., Yavne, Israel

Filed Aug. 29, 1973, Ser. No. 391,164
Claims priority, application Israel, Sept. 5, 1972, 40295
Int. Cl. F01k *25/08*
U.S. Cl. 60—651 **11 Claims**

1. A closed Rankine cycle power plant comprising an organic fluid with a freezing point above the effective ambient temperature, a boiler for vaporizing the fluid from its liquid state, a turbine for expanding the vapor and driving a load such as an electric generator, a condenser exposed to a heat sink at ambient temperature for converting the turbine exhaust vapors to a liquid at a lower temperature and pressure than in the boiler, and means for feeding the condensed liquid



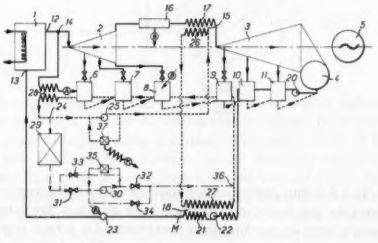
back into the boiler, the condenser having means for effecting the freezing of condensate on the inside of the condenser without blocking the flow of vapors into the condenser.

3,886,749

STEAM POWER STATIONS

Pierre Henri Pacault, Ville D'Avray, France, assignor to Babcock-Atlantique Societe Anonyme, Paris, France

Filed July 10, 1973, Ser. No. 377,952
Claims priority, application France, July 13, 1972, 72.25450; Jan. 26, 1973, 73.02789; Jan. 26, 1973, 73.02790
Int. Cl. F01k *3/00*
U.S. Cl. 60—652 **29 Claims**



1. A method of operating a steam power station with a variable-demand network, the station comprising a generating installation including a heat source, a steam generator, at least one steam turbine, and an accumulator adapted to draw heat from the installation by transfer with a heat-transfer fluid; said method comprising the steps of storing said heat and subsequently restoring it to the installation for operation of same, characterized by the fact that the heat-transfer fluid for the transferring of heat between the installation and the accumulator is in heat-exchange relation with steam of which at least a part has performed mechanical work in said turbine.

3,886,750

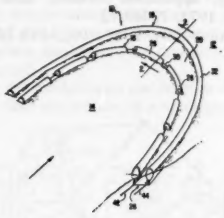
OIL CONTAINMENT APPARATUS

Ray R. Ayers, and Errol V. Seymour, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 81,305, Oct. 16, 1970, abandoned. This application Apr. 24, 1972, Ser. No. 247,079
Int. Cl. E02b *15/04*
U.S. Cl. 61—1 F **15 Claims**

1. Apparatus for controlling a spill of floating liquid pollutant on a water surface experiencing a relative current velocity therepast comprising:
spaced apart buoyant float means defining therebetween a capture area;

means defining a path of water movement generally horizontally into the capture area and generally downwardly out of the capture area; and



flow restriction means in the inlet to the capture area;

flow restriction means in the outlet from the capture area for reducing the flow velocity in the capture area below the relative current velocity, the outlet flow restriction being effectively greater than the inlet flow restriction.

3,886,751

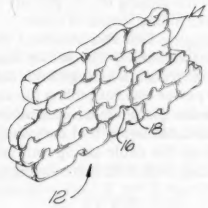
AQUATIC CONSTRUCTION MODULE AND METHOD OF FORMING THEREOF

Mauricio Porraz Jimenez Labora, Bosque de Moctezuma No. 9, Mexico City, Mexico

Filed Nov. 12, 1973, Ser. No. 415,059

Int. Cl. E02b *3/00, 7/08*

U.S. Cl. 61—3 **6 Claims**



1. A construction module for in situ placement of aggregate comprising:

a collapsible bag of nonporous material, said bag being collapsible for storage and transportation, and expandable for filling with aggregate;

said bag having an inlet means including an outwardly extending protuberance for receiving said aggregate at the construction site;

said bag having an outlet means including an outwardly extending protuberance for relief of pressure build-up in said bag as aggregate is inserted therein;

means disposed in said inlet and outlet means including a rod permanently affixed therein and extending through said protuberance into said bag for retaining said inlet and outlet means open during the filling of said bag with said aggregate; and

means formed on said bags for interlocking adjacent filled bags with each other for preventing movement of said bags due to water movement against said bags comprising an elongate inlet and an elongate outlet and a metal reinforcing rod centrally positioned in said inlet and outlet extending parallel to the axis of said inlet and outlet, said outlet enabling air to escape from said bag when said aggregate is fed into said bag.

3,886,752

PREFABRICATED ELEMENT FOR WALL CONSTRUCTION

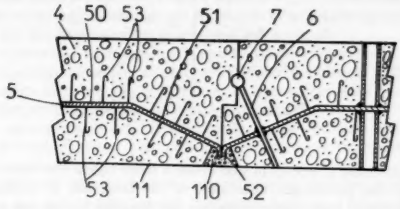
Gaston Denoor, Grenoble, France, assignor to B.V.S., Grenoble, France

Filed Nov. 29, 1973, Ser. No. 419,926

Claims priority, application France, Jan. 9, 1973, 73.00560

Int. Cl. E21d *11/08*

U.S. Cl. 61—45 R **2 Claims**



2. A prefabricated element for use in the construction of a fluid-tight wall comprising a plurality of such elements positioned side by side with their lateral faces in contact, said element comprising:

a body of moulded material;

an impermeable sheet member embedded in said body and adhering thereto, said sheet member having a rim extending about the periphery thereof and tangentially to the lateral faces of said body, such that when two such elements are positioned side by side, said rims of said sheet members of said elements contact each other, the element being an arch-stone of rectangular form having an intrados face, a curved extrados face and four lateral faces, chamfers along the edges of the intrados face, into which said rims of said sheet member extend, said sheet member having a curved central portion extending in the central portion of the arch-stone, and four inclined lateral faces each projecting into said chamfer of said intrados face and being extended by said rim tangential to the plane of the corresponding lateral face, a mortar injection tube passing through said sheet member and extending from the intrados face, and said tube opening into a recess formed in a lateral face of the element extending along the lateral face between the sheet member and the extrados face.

3,886,753

SUBMERSIBLE STRUCTURES

Jal Nariman Birdy, 61, Summit Rd., Northolt, Middlesex, and Shirley Bowers Stubbs, 3, Birkdale Rd., Ealing, Longdon, W5, both of England

Filed Mar. 28, 1973, Ser. No. 345,757

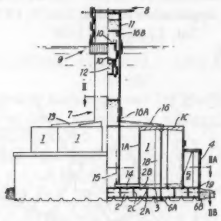
Claims priority, application United Kingdom, Apr. 4, 1972, 15546/72

Int. Cl. E02b *17/00;* **B65g** *5/00;* **B65d** *11/00*

U.S. Cl. 61—46.5 **12 Claims**

1. A submersible structure that can be floated to a desired location and then caused to sink so as to rest on the water bed, the structure comprising a reinforced concrete cellular base, a pluraliity of reinforced concrete hollow containers upstanding from said reinforced concrete cellular base, a solid reinforced concrete perimeter wall also upstanding from the base and completely encircling said containers to form an upwardly open interior space which is capable of holding water, at least one reinforced concrete hollow column extending from the cellular base to above water level in use of the structure, valves and ducting extending from the interiors of the containers and the cellular base to services situated inside the column, whereby, from the floating condition, the structure can be caused to sink by supplying ballast water to said interior space between the containers and the outer perimeter wall, to the

interior of the cellular base and to the interiors of the containers, and whereby the structure can be refloated by pumping these zones dry and a separator chamber in said column connected by said ducting to said containers, said separator chamber being at a level in said column to be below the water level in the submerged condition of the structure to reduce by external hydrostatic pressure, the bursting forces due to the storage of liquid in said containers.



3,886,754

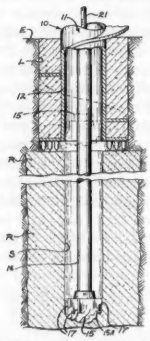
METHOD OF EXTENDING AUGERED PILE CAVITY THROUGH ROCK OR LIKE OBSTRUCTION

Lee A. Turzillo, 2078 Glengary Rd., Akron, Ohio 44313

Filed July 27, 1973, Ser. No. 383,454

Int. Cl. E02d *5/34, 15/04*

U.S. Cl. 61—53.64 **4 Claims**



1. A method of forming a pile or like column in an earth situs including a rock-like formation, comprising the steps of screwing a hollow-shafted, spiral-flighted auger axially into the earth of the situs to drill a cavity therein to a depth encountering the rock formation; operating a hollow-shafted rock drill through the hollow shaft of the auger, with a drill bit presented inwardly, to drill a cavity extension of selective depth and given diameter in the rock formation; applying fluid pressure means within the rock cavity to remove the drilled rock cuttings therefrom through the auger shaft; withdrawing the rock drill through the auger shaft; such hollow shaft of such rock drill having an outer diameter substantially less than the inner diameter of the auger shaft, and such drill bit including peripherally spaced rock cutting blades and guide means including axially extending edges on the blades of substantial axial extent having an outer diameter slightly less than the inner diameter of such auger shaft which engage the rock cavity wall and extend into the auger shaft during withdrawal of the rock drill to guide the drill bit from the cavity extension axially into the hollow shaft auger; and feeding pressurized, self-hardenable, fluid material into the cavity and cavity extension to form a columnar body.

3,886,755

METHOD FOR LOCATING AN UNDERGROUND CABLE

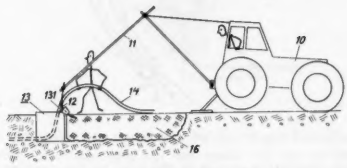
Holger Alexander Lundin, Enskede, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed June 6, 1973, Ser. No. 367,425

Claims priority, application Sweden, June 21, 1972, 8164/72; Feb. 20, 1972, 23400/72

Int. Cl. A01b *3/64;* **F16l** *1/00;* **A01b** *13/08*

U.S. Cl. 61—72.6 **7 Claims**



1. A method of laying an underground cable, said method comprising the steps of:

providing a digging assembly including a movable but stationarily operating power plant, a digging tool, a cable laying tool and a pulling mechanism coupled at one end to the power plant and extendable to a selected distance, the extended end of the mechanism being attachable to either tool;

moving the power plant to a location selected for laying an underground cable;

attaching the digging tool to the pulling means and extending the same to a position at which the digging tool is at a selected distance from the power plant;

activating the power plant for pulling back the digging tool to effect loosening of the strip of ground along the withdrawal path of the digging tool to prepare said ground for laying a corresponding length of cable;

detaching the digging tool and attaching the cable laying tool and again extending the pulling means along the length of the strip of loosened ground; and

reactivating the power tool for pulling the cable laying tool back to the power plant while simultaneously paying out cable from the cable laying tool and placing the cable in space cleared by the cable laying tool in the ground by and while pulling back said cable laying tool.

3,886,756

SEPARATION OF GASES

Rodney John Allam, Guildford, and Bernard Ramsay Bligh, Hampton Hill, both of England, assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 1, 1973, Ser. No. 356,264

Claims priority, application United Kingdom, May 10, 1972, 21984

Int. Cl. F25j *3/100*

U.S. Cl. 62—13 **6 Claims**

1. A method of separating a feed gas mixture obtained by the steam reforming of natural gas followed by the removal of a substantial portion of the carbon dioxide by an absorption process and the water vapor by condensation which mixture contains hydrogen, carbon monoxide, not more than 1 mol. % carbon dioxide, not more than 1 mol. % water vapor and small quantities of nitrogen and methane for the production of carbon monoxide which comprises:

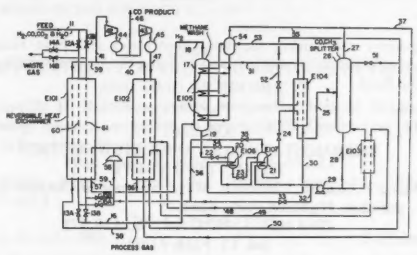
a. passing said feed mixture through and cooling said mixture in a first set of passages in a heat exchanger containing at least two sets of passages to deposit said carbon dioxide and water vapor in solid form on the inner surface thereof;

b. countercurrently passing a hydrogen-rich stream at a pressure lower than that of said feed gas mixture through

and warming said stream in a second, adjacent set of passages in said heat exchanger;

c. periodically passing said feed gas mixture through and cooling said mixture in said second set of passages to deposit said carbon dioxide and water vapor on the inner surface thereof and countercurrently passing said hydrogen-rich stream through and warming said stream in said first set of passages to re-evaporate substantially all of the solid carbon dioxide and ice deposited on the inner surface thereof;

d. passing the cooled feed gas mixture from said heat exchanger into the bottom of a methane wash column;



e. expanding the hydrogen stream recovered from the top of said column and recycling at least a part of said hydrogen to said heat exchanger as said hydrogen-rich stream;

f. letting down the pressure of the liquid withdrawn from the bottom of said wash column to effect further hydrogen removal;

g. partially vaporizing said liquid from step (f) and passing the resulting stream into a distillation column to separate carbon monoxide product from the methane; and

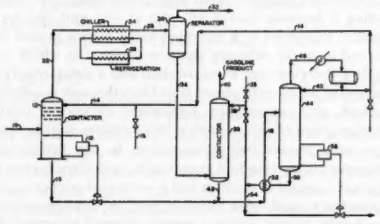
h. recovering said carbon monoxide product.

3,886,757

REDUCTION OF HYDRATE FORMATION IN A NATURAL GAS STREAM BY CONTACTING WITH ANIT-FREEZE AGENT

William A. McClintock, and Merlin O. Clark, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 101,372, Dec. 24, 1970, abandoned.
This application Dec. 3, 1973, Ser. No. 421,367
Int. Cl. F25j *3/00*
U.S. Cl. 62—20 **8 Claims**



1. In a process for reducing the moisture content of a moisture-containing stream of natural gas without substantail moisture removal prior to introducing an antifreeze agent into said gas stream, wherein said gas, which is at an atmospheric temperature in the range 40°–125°F, is contacted in a first contacting zone with an amount of an aqueous liquid solution containing 51 to 90 weight percent of a low boiling (high vapor pressure) desiccant-antifreeze agent and 49 to 10 weight percent water at a temperature in the range 40°–125°F and pressure conditions sufficient to absorb a major portion of said moisture from said gas and simultaneously vaporize an amount of said agent into said gas which is sufficient to prevent solids formation in subsequent low temperature processing of said gas, said thus-treated gas is then chilled to a temperature sufficient to condense substantially all of the propane and heavier hydrocarbons therefrom leaving a residue gas rich in methane and ethane, and a liquid stream comprising said condensed propane and heavier hydrocarbons, water, and said agent, but at a temperature sufficiently above the eutectic freezing point for the water-agent solution to prevent freezing of the water-agent solution and formation of solids during said chilling, the improvement comprising the steps of:

a. contacting said separated liquid stream with water in a countercurrent contacting zone under conditions sufficient to substantially extract said agent from said condensed propane and heavier hydrocarbons;

b. recovering overhead essentially agent-free said condensed propane and heavier hydrocarbons from said countercurrent contacting zone;

c. passing a bottoms stream comprising water and said agent from said countercurrent contacting zone to a fractionation zone;

d. withdrawing an overhead stream comprising 51 to 90 weight percent of said agent and 49 to 10 weight percent of water from said fractionation zone;

e. returning said overhead stream of step (d) to said first contacting zone as at least a portion of said agent used therein;

f. withdrawing a bottoms stream comprising water from said fractionation zone; and

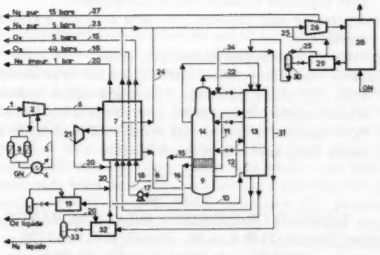
g. adjusting the water content of said aqueous solution of said agent in said overhead stream by adjusting conditions in said fractionation zone of step (d) so as to control the water content of said withdrawn overhead stream of step (d).

3,886,758

PROCESSES FOR THE PRODUCTION OF NITROGEN AND OXYGEN

Guy Perrotin, Sucy-en-Brie, and Jean-Pierre Anselmini, Paris, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des procedes Georges Claude, Paris, France

Continuation of Ser. No. 69,591, Sept. 4, 1970, abandoned.
This application Aug. 23, 1973, Ser. No. 390,943
Claims priority, application France, Sept. 10, 1969, 69.30785
Int. Cl. F25j *3/02*
U.S. Cl. 62—30 **4 Claims**



1. A process for separating air into oxygen and nitrogen, while vaporizing liquefied natural gas, comprising:

a. cooling and at least partially liquefying a compressed feed stream of air, by heat exchange with at least a part of oxygen and nitrogen separated from air;

b. separating said liquefied air feed stream in at least a rectification zone under a pressure substantially above

atmospheric pressure, into oxygen and nitrogen, whereby at least said nitrogen is obtained under said pressure substantially above atmospheric;

c. work expanding at least a part of said nitrogen in gaseous phase to around atmospheric pressure, and heating said expanded part in heat exchange with the compressed air feed stream;

d. compressing a stream of said oxygen in liquid phase above said pressure substantially above atmospheric;

e. vaporizing and heating said compressed oxygen stream in heat exchange with at least said air feed stream;

f. heating another part of said nitrogen in gaseous phase to a temperature below ambient temperature;

g. compressing a stream of said heated nitrogen;

h. at least partially condensing said compressed nitrogen stream in countercurrent heat exchange with liquefied natural gas being vaporized, wherein said compressed stream of nitrogen is liquefied under a lower pressure than the pressure at which liquefied natural gas is vaporized in heat exchange with said compressed stream;

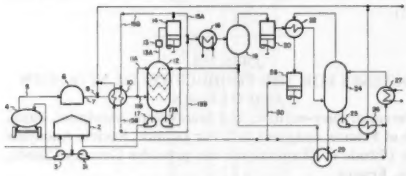
i. expanding at least a part of said liquefied nitrogen stream to said pressure substantially above atmospheric and returning said part to the top of said rectification zone as reflux.

3,886,759

METHOD FOR RECOVERY OF HYDROCARBON VAPORS

Gerald P. McNamee, 2320 Riverside Dr., Santa Ana, Calif. 92706

Filed Jan. 26, 1973, Ser. No. 326,606
Int. Cl. F17c *13/00*
U.S. Cl. 62—54 **8 Claims**



1. A method of recovering hydrocarbon vapors from a hydrocarbon vapor-air mixture which is being expelled from a vessel during the filling of said vessel with hydrocarbons comprising the steps of

controlling the hydrocarbon content of said vapor/air mixture by controlling the temperature thereof,

controlling the volume of said vapor/air mixture and passing said vapor/air mixture into a compressor,

compressing said vapor/air mixture to form a compressed mixture,

cooling said compressed mixture, and

passing said compressed mixture into a first absorber to form and absorbed mixture having a liquid hydrocarbon at a controlled temperature whereby said liquid hydrocarbon removes a substantial protion of said hydrocarbon vapor from said compressed mixture.

3,886,760

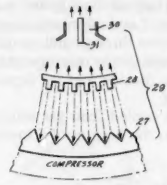
METHOD OF INDIRECT HEAT EXCHANGE

Stephen Wyden, 1158 E. 8 St., Brooklyn, N.Y. 11230

Filed Sept. 3, 1970, Ser. No. 70,299
Int. Cl. F25b *1/00*
U.S. Cl. 62—114 **24 Claims**

1. A method of heat exchange wherein the coolant is a fluid, comprising a two phase mixture, wherein one phase is a gas, either an aerosol or foam, comprising the steps of:

passing the coolant into a chamber in direct contact with another chamber containing a material to be cooled, permitting thermal exchange between the coolant and the material through the wall between the two chambers, removing the coolent after absorbing the heat of the material, and compressing the coolant,



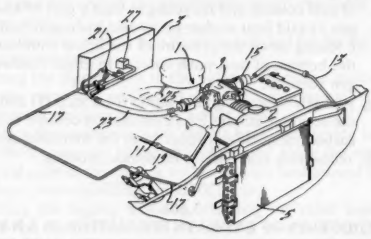
thereby maximizing the heat absorption and heat release capabilities of the coolant and utilizing the compressibility of the fluid.

3,886,761

THERMOSTATICALLY OPERATED SUCTION THROTTLING VALVE

Mario P. Santini, Clarkston, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Mar. 3, 1971, Ser. No. 120,575
Int. Cl. F25b *41/04*
U.S. Cl. 62—217 **2 Claims**



1. Air conditioning apparatus comprising a compressor having a suction and a discharge side, an evaporator, a condenser, a first line joining the discharge side of said compressor to an inlet in said condenser, a second line joining an outlet in said condenser to an inlet in said evaporator, and a third line joining an outlet from said evaporator to the suction side of said compressor, said line joining said evaporator to said compressor including means for throttling the flow of refrigerant from said evaporator to said compressor, said means including a housing having an inlet at one end and an outlet adjacent the other end, movable valve means in said housing adapted to move between an open position in which refrigerant flow therethrough is established and a substantially closed position in which refrigerant flow therethrough is substantially blocked, and temperature responsive means for controlling the movement of said movable valve means, said temperature responsive means being responsive to the temperature of refrigerant in leaving said evaporator, said valve means including a valve member portion and a valve seat portion, a retainer connected to said valve member portion, temperature responsive means in said retainer means adapted to contract in response to a decrease in the temperature of refrigerant thereabout and to expand in response to an increase in the temperature of refrigerant therearound, a diaphragm extending across one end of said retainer, a rod one end of which engages said diaphragm and movable relative to said valve member portion, the other end of said rod being adjacent said other end of said housing and held against movement in one direction beyond a predetermined point by engagement thereof with said other end of said housing, and means biasing said retainer means and diaphragm in said one direction, said valve

member portion being held in said open position by said rod when the temperature of refrigerant around said temperature responsive materials is above a predetermined temperature which results in freezing of condensate on said evaporator and said temperature responsive material is of a predetermined volume, said means biasing said retainer means in said one direction moving said valve member portion toward said valve seat portion and said substantially closed position when the temperature of said temperature responsive materials approaches said predetermined temperature and the volume of said temperature responsive materials is being reduced at least one passage in one of said portions for permitting the passage of refrigerant therethrough when said valve member portion is seated on said seat portion.

3,886,762

APPARATUSES FOR FREEZING ARTICLES OF FOOD AND SIMILAR PRODUCTS

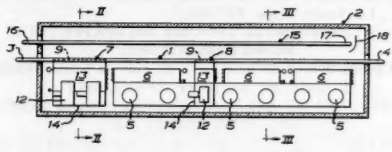
Sven-Olle H. Rothstein, and Sture Aström, both of Helsingborg, Sweden, assignors to Frigoscandia Contracting AB, Helsingborg, Sweden

Filed Aug. 28, 1973, Ser. No. 392,217

Claims priority, application Sweden, Sept. 15, 1972, 11910/72

Int. Cl. F25d *25/04*

U.S. Cl. 62—380 **5 Claims**



1. Apparatus for freezing articles of food and similar products, comprising between side walls a perforated conveyor feeding the product through a freezing chamber, and at least one device, delimited to a small part of the length of said conveyor, for directing a gaseous refrigerant up through the conveyor in order to set the product in motion during freezing, wherein said device comprises a perforated bottom mounted immediately underneath said conveyor and permitting a controlled fluidized bed to be maintained above it, the space allowed for said fluidized bed being defined by the side walls and the product on the conveyor before and after the location of the perforated bottom.

3,886,763

SELF-DRIVEN REFRIGERATOR

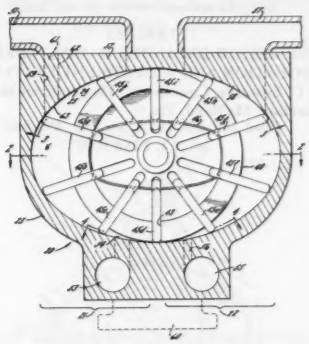
Thomas C. Edwards, Casselberry, Fla., assignor to The Rovac Corporation, Maitland, Fla.

Filed Feb. 26, 1974, Ser. No. 445,839

Int. Cl. F25d *17/04*

U.S. Cl. 62—402 **8 Claims**

1. A rotary compressor-expander for use as a refrigeration device in conjunction with a pressurized fluid source having a pressure above the ambient level, comprising in combination, a stator including a compressor chamber and an expander chamber, the compressor and expander chambers each having inlet and outlet ports, vane-type rotor means rotatably mounted within the chambers and having a plurality of vanes maintained substantially in contact with the walls of the chambers for defining individual segments, end plates for supporting the rotor means and sealing the chambers and the segments therewithin, rotation of the rotor means serving to progressively decrease the volume of the compressor segments and increase the volume of the expander segments, the inlet port of the compressor chamber being connected to the pressurized fluid source, a heat exchanger connected between the compressor outlet port and the expander inlet port for removing heat from the fluid being cooled while maintaining a substantially constant fluid pressure, the compressor and expander chambers being non-symmetrically constructed so that the differential change in volume in the expander chamber per revolution is greater than the differential change in



volume in the compressor chamber in such revolution with the result that the rotor is driven by the potential energy in the pressurized fluid being cooled.

3,886,764

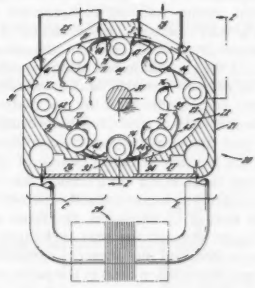
COMPRESSOR-EXPANDER HAVING TILTING VANES FOR USE IN AIR CONDITIONING

Thomas C. Edwards, Casselberry, Fla., assignor to The Rovac Corporation, Maitland, Fla.

Filed July 29, 1974, Ser. No. 492,608

Int. Cl. F25d *9/00*

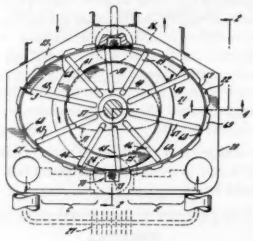
U.S. Cl. 62—402 **23 Claims**



1. In a compressor-expander for use in air conditioning, the combination comprising a housing defining a chamber of oval cross section having a compression side and an expansion side and enclosed by end plates, a cylindrical rotor extending between the end plates and having shafts journaled therein, means defining compression side inlet and outlet ports as well as expansion side inlet and outlet ports, a heat exchanger interposed between the compression side outlet port and the expansion side inlet port, the rotor having a plurality of axially-extending vanes secured to its periphery and extending between the end plates, the vanes being retreatingly angled with respect to the direction of rotor rotation, each of the vanes being in the form of a laminated leaf spring secured cantilever-fashion to the rotor along its inner edge, each of the vanes having a sealing member in the form of an enlargement extending along the outer edge for sealing against the wall of the chamber the sealing member carrying rollers at its ends for riding against the wall of the chamber and for establishing running clearance between the sealing member and the wall, the sealing member having a curved profile as viewed axially generally following the contour of the rollers so that the run-

ning clearance of the vane with respect to the wall of the chamber remains substantially constant in all phase positions of the rotor.

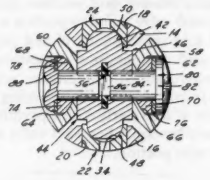
3,886,765
COMPRESSOR-EXPANDER HAVING THERMAL ISOLATION AND ADJUSTMENT FEATURES
Thomas C. Edwards, Casselberry, Fla., assignor to The Rovac Corporation, Maitland, Fla.
Filed July 29, 1974, Ser. No. 492,885
Int. Cl. F25d *9/00*
U.S. Cl. 62—402 **23 Claims**



1. In a compressor-expander for use in air conditioning, the combination comprising a housing defining a chamber having an outer wall of oval profile having a compression side and an expansion side and enclosed by end plates, a cylindrical rotor extending between the end plates and having a shaft journalled therein, means defining compression side inlet and outlet ports as well as expansion side inlet and outlet ports, a heat exchanger interposed between the compression side outlet port and the expansion side inlet port, the rotor having a plurality of radially movable and outwardly biased vanes extending into engagement with the end plates, a liner in the form of a flexible strip of oval profile covering the outer wall and having port openings in respective communication with the ports in the housing so that a charge of air drawn in between adjacent vanes at the compression side inlet port when the rotor is rotated: (a) is compressed with increase in temperature due to heat of compression, (b) flows at substantially constant pressure through the heat exchanger where heat of compression is absorbed and then (c) expands in the expansion side to produce a sharp drop in temperature for discharge in the cold state through the expansion side outlet port, the liner being of thin cross section for limited heat conductivity and having a layer of insulation between it and the outer wall for preventing flow of heat through the housing from the compression side to the expansion side.

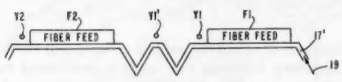
3,886,766
UNIVERSAL JOINT
Emil C. Selmek, Temperance, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Dec. 3, 1973, Ser. No. 421,469
Int. Cl. F16d *3/26*
U.S. Cl. 64—17 R **9 Claims**

1. A universal joint comprising a first yoke having a first pair of spaced arms,
a pair of bearing members pivotally engaging said first pair of arms,
a second yoke having a second pair of spaced arms,
a pivot member extending between said second pair of arms,
means pivotally connecting said pivot member to said second pair of arms,
said pivot member being interposed between said pair of bearing members,



said pivot member being constructed to hold said bearing members in engagement with said first pair of arms.

3,886,767
METHOD OF MODIFYING A PILE FABRIC MACHINE
Philip A. Dargie, Andover, Mass., assignor to Malden Mills, Inc., Lawrence, Mass.
Filed Sept. 20, 1973, Ser. No. 399,144
Int. Cl. D04b *9/14, 9/12*
U.S. Cl. 66—9 B **2 Claims**

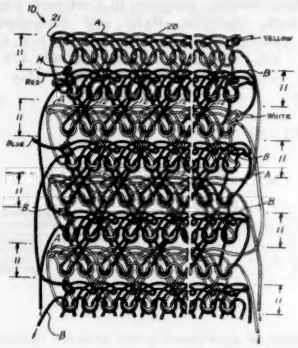


1. The method of modifying a pile-fabric knitting machine which has alternating fiber-feed and yarn-feed stations in the direction of the needle travel for increasing the rate of fabric production comprising the step of adding a yarn-feed station following at least one yarn-feed station on the machine without providing another fiber-feed station therebetween such that the modified machine contains at least two yarn-feed stations for controlling the formation of respective separate courses arranged one after the other in the direction of the needle travel without any fiber-feed station being positioned therebetween, whereby on the modified machine two courses, only one of which has pile fabric held by its constituent loops, are formed in place of the single course formed on the machine before it is modified, which two courses may be controlled to have the same fiber weight per unit area as said single course be increasing the rate at which fiber is fed during the formation of said only one course.

3,886,768
CROSS STITCH CROCHETED FABRIC
Shirley Anderson, 6547 Lang Ave., Sacramento, Calif. 95823
Filed Feb. 1, 1973, Ser. No. 328,506
Int. Cl. D04b *21/00*
U.S. Cl. 66—195 **3 Claims**

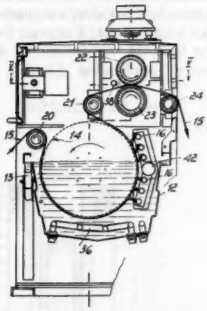
1. A crocheted reversible fabric having opposite sides with opposite faces with the stitch pattern duplicated on each face having a plurality of spaced apart parallel ribs on one side of the fabric connected to a plurality of spaced apart parallel ribs on the opposite side of the fabric, a plurality of spaced apart cross stitches extending between and connecting adjacent ribs

on one side of the fabric and a plurality of spaced apart cross stitches extending between and connecting adjacent ribs on



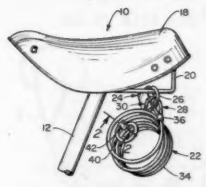
the other side of the fabric, said cross stitches overlying the ribs on the side of the fabric opposite said cross stitches.

3,886,769
WIDTH WASHING PLANT, PARTICULARLY FOR DELICATE FABRICS
Fulvio Conti, P.O. Box 28 Via Carnovali 88, Bergamo, Italy
Filed June 18, 1973, Ser. No. 371,312
Claims priority, application Italy, Feb. 26, 1973, 20857/73
Int. Cl. B05c *3/138, 5/02*
U.S. Cl. 68—15 **11 Claims**



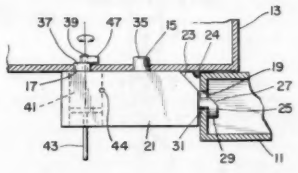
1. An open width washing plant for unfolded fabric, particularly for delicate fabrics, comprising a unit for introducing the fabric into the plant, a plurality of wash stations, at least one box for storing the fabric, and a unit for collecting the fabric treated in the plant, in which each of said wash stations comprises a wash tank containing liquid, at least one rotating drum on a portion of which rests the fabric, said drum being partially immersed in said wash tank and having its axis of rotation disposed in a direction transverse to the direction of movement of the fabric, a plurality of spray elements disposed adjacent to at least one portion of the external surface of said drum and projecting liquid againt it, a portion of said spray elements being disposed above and a portion below the surface of the liquid contained in said wash tank, means for spreading the fabric out in a direction substantially transverse to its direction of movement being disposed upstream and downstream of said rotating drum, and means for wringing the fabric disposed downstream of said rotating drum.

3,886,770
DOUBLE LOCKING SECURITY APPARATUS
Gordon F. Smith, Santa Barbara, Calif., assignor to Helistrand, Inc., Santa Barbara, Calif.
Filed Jan. 2, 1974, Ser. No. 430,165
Int. Cl. E05b *73/00*
U.S. Cl. 70—18 **9 Claims**



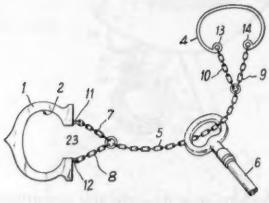
1. A double locking security apparatus comprising:
an extended length of a continuous constant diameter cable having a pair of ends;
a first loop attached to one of said ends and a second loop attached to the other of said ends; and
a third loop connected to said continuous cable intermediate said first and second loops, said third loop being an integral part of said continuous cable and forming a full circle, said continuous cable being extendable around an article and the shackle of a padlock is to be passed through each of said loops thereby creating two separate locking areas within the confines of said continuous cable.

3,886,771
KEYED REMOVABLE DOOR LOCK
Milton Robins, Marina Del Rey, Calif., assignor to Packaging Techniques, Inc., El Segundo, Calif.
Filed Mar. 12, 1973, Ser. No. 340,320
Int. Cl. E05b *65/08*
U.S. Cl. 70—90 **12 Claims**



1. A device for prohibiting relative movement of a pair of structures which are otherwise relatively movable comprising a body having
a plurality of surfaces thereon which are substantially parallel to adjacent surfaces of the structures,
a first pin means extending normally from a first of said surfaces and having
chamfer means on one side of the leading edge thereof and
lip means on the opposite side thereof, and
a second pin means extending normally from a second of said surfaces, said second pin means having
pivot means at the extremity thereof and offset from the axis thereof and
flange means, having a substantially identical periphery as that of said pin, mounted on said pivot means.

3,886,772
KEY HOLDER
Robert Hocq, Boulogne-sur-Seine, France, assignor to Societe Franco Hispano-Americaine, (Francispam) Saint-Gratien, France
Filed Nov. 26, 1973, Ser. No. 418,987
Claims priority, application France, Nov. 29, 1972, 72.42415
Int. Cl. A47g 29/10
U.S. Cl. 70—456 R 7 Claims

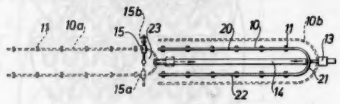


1. Key holder which comprises an arcuate, generally C-shaped rigid member having an elongated concave surface defining the inner edge of the C, said concave surface being provided with a median groove extending lengthwise thereof, an arcuate resilient member mating with said groove and dimensioned to be received within said groove without protruding radially therefrom, and a chain connected by one of its ends to said rigid member and by its other end to the resilient member.

3,886,773
KEY HOLDER
Welbourne D. McGahee, Melbourne, Fla., assignor to Loop-A-Line, Inc., Melbourne, Fla.
Filed Apr. 22, 1974, Ser. No. 463,084
Int. Cl. A44b 15/00, 21/00
U.S. Cl. 70—457 4 Claims

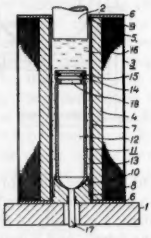
1. A key holder comprising a storage loop, a left slim elongated loop on one end of said storage loop for receiving keys on said storage loop, a right enlarged elongated loop on the other end of said storage loop, said storage loop being made of springy wire whereby said left loop is reversibly passable over said right loop, a special connector including a loop interconnectible with said storage loop, an eye on one end of said special connector loop, an end connector on the other end of said special connector loop, a shank member passing through said end connector and said eye on said special connector loop, said shank member having a head positioned below said eye on said special connector loop, and means on the other end of said shank member for restraining movement of said end connector.

3,886,774
METHOD AND MEANS FOR SHOT PEENING OF TUBES
Sven Sixten Stromstedt, and Sven Borje Bystrom, both of Sandviken, Sweden, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim, Ruhr and Mannesmannrohren-Werke Aktiengesellschaft, Dusseldorf, both of, Germany
Filed May 22, 1974, Ser. No. 472,470
Claims priority, application Sweden, May 30, 1973, 73076820
Int. Cl. C21d 7/06
U.S. Cl. 72—53 7 Claims



1. Method of shot peening the external surface of a tube that is partly straight and partly curved, using an assembly of shot peening nozzles arranged concentrically around and directed towards the tube, according to which for shot peening a straight portion of the tube the nozzle assembly is held stationary and the tube is moved in a straight path with said straight portion passing through the nozzle assembly, while for shot peening a curved portion of the tube the tube is held stationary and the nozzle assembly is moved about the curved portion.

3,886,775
DIE FOR MANUFACTURING RODS OR WIRE OF COMPOUNDS MATERIAL WITH NON-ROUND CROSS-SECTION
Torsten Korsell; Hans Larker; Erik Lundblad, and Jan Nilsson, all of Robertsfors, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed Mar. 21, 1974, Ser. No. 453,388
Claims priority, application Sweden, Apr. 10, 1973, 73050114
Int. Cl. B21c 25/02
U.S. Cl. 72—60 7 Claims

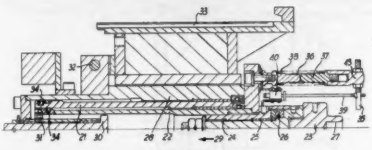


1. Die for manufacturing rods with a core of aluminium or an aluminium alloys and a casing of copper or a copper alloy by hydrostatic extrusion of a compound billet having an inlet portion having an outer part and a cup-shaped bottom part and a die opening in the bottom part having longer and shorter sides, the tangents to the generatrices to the bottom part forming a continuously increasing angle from the outer part to the die opening, the tangents to the bottom part of the generatrices in axial section through the die perpendicular to the longest side of the die opening, forming an angle (2α) which is between 120° and 180°, the outer part of the die being a conical part which merges into the cup-shaped bottom part.

3,886,776
END STOP FOR A FORMING MACHINE

David Ian Hudson, Nottingham, England, assignor to Raleigh Industries Limited, Nottingham, England

Filed Feb. 26, 1974, Ser. No. 445,919
Claims priority, application United Kingdom, Feb. 28, 1973, 10152/73
Int. Cl. B21h 9/00
U.S. Cl. 72—71 19 Claims

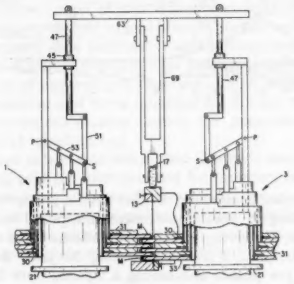


1. A bar stop for a forming machine comprising a part movable in relation to the remainder of the stop, means enabling said part to be moved between the forming tools of said machine and up to the end of a bar to be formed, means operative to restrict the movement of the part in a direction opposite to the first mentioned direction under the action of the bar, and means operative to release the restriction to accommodate growth in the bar in the opposite direction during a forming operation.

3,886,777
BELLOWS-FORMING APPARATUS

Charles E. Harless, West Paducah, Ky., and Ward G. Taylor, Vienna, Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 19, 1974, Ser. No. 507,493
Int. Cl. B21d 15/06
U.S. Cl. 72—84 10 Claims

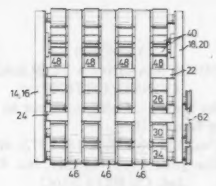


1. An apparatus including a pair of parallel and axially extending rotatable assemblies for cooperatively forming convolutions in a blank positioned therebetween and thus effecting progressive shortening of said blank in a direction transverse to said convolutions, each of said assemblies including a rotatable shaft carrying a plurality of axially movable, circular mandrels, the mandrels of one assembly in interleaving relation with those of the other assembly, the improvement comprising first and second pluralities of axially slidable sleeves respectively mounted to the shafts of said assemblies, said sleeves circumferentially supporting individual ones of said mandrels, each of said sleeves coaxial with its respective mandrel.

3,886,778
APPARATUS FOR THE ROLLER STAMPING OF THIN SHEETS, ESPECIALLY STARTING SHEETS FOR ELECTROLYTIC PRODUCTION OF COPPER

Olov Carl Gustav Wennberg, 16, Champ du Vert Chasseur, Bruxelles, Belgium

Filed June 18, 1973, Ser. No. 370,622
Claims priority, application Sweden, June 19, 1972, 8056/72
Int. Cl. B21d 5/16
U.S. Cl. 72—180 3 Claims

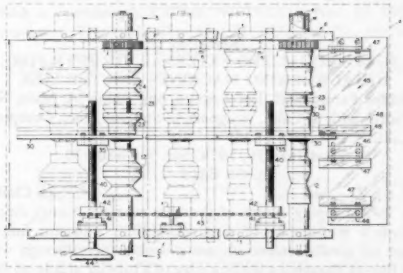


1. Apparatus for corrugating thin sheets, comprising a pair of opposed contoured rollers each of which has a plurality of cylindrical portions thereon of alternately large and small diameter that register with respective portions of alternately small and large diameter on the other said roller, a plurality of endless bands passing about said rollers, alternate bands passing about said small portions of one said roller, the remaining bands passing about said small portions of the other said roller, said bands having a length substantially greater than the periphery of said rollers and a width about equal to the axial length of the said small portions about which they pass, and further rollers having axes parallel to said stamping rollers and about which the remaining portions of said bands are trained.

3,886,779
MACHINE FOR ROLL FORMING VARIABLE WIDTH PROFILES

Lamont R. McClain, Mehlville, Mo., assignor to Engel Industries, Inc., Ballwin, Mo.

Filed Apr. 17, 1974, Ser. No. 461,542
Int. Cl. B21d 5/08
U.S. Cl. 72—181 10 Claims



2. In a roll forming machine in which metal strips are progressively formed to a profile, the machine being of the type having at least two parallel side frame assemblies at a substantially fixed spacing, a succession of pairs of upper and lower powered roll spindles mounted by and perpendicular to and rotatable in said frame assemblies, power train means to rotate said spindles, and complementary upper and lower forming roll sets thereon, each set including an axially constant roll and an axially shiftable roll,

the invention comprising

laterally shiftable frame means parallel and intermediate to said fixed frame assemblies and having apertures through which said roll spindles pass, said shiftable frame means being adjacent to the shiftable rolls and remote from the contstant rolls,

means to shift said laterally shiftable frame means, and

rotation-permitting and thrust transfer means connecting the shiftable frame means and the shiftable rolls,

whereby to establish and change a spacing, common to all of said spindles, between the shiftable rolls and the constant rolls on the spindles simultaneously.

3,886,780

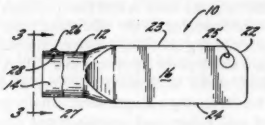
METHOD OF MAKING A TUBULAR KEY CONSTRUCTION

Morris Falk, Palm Springs, Calif., assignor to Fort Lock Corporation, River Grove, Ill.

Division of Ser. No. 323,980, Jan. 15, 1973, abandoned. This application June 17, 1974, Ser. No. 479,866

Int. Cl. B21d *53/42*

U.S. Cl. 72—324 **1 Claim**



1. The method of forming a lock actuating protrusion on a formed tubular key having a tubular shank and a generally flat handle portion, the shank being adapted to be inserted in an annular keyway of an axial pin tumbler lock, comprising the steps of forming an opening radially through one side of the tubular key shank and inserting a forming tool through said opening and deforming the opposite side of said tubular shank radially outward to form a generally dome shaped projection on the outer surface of the tubular shank.

3,886,781

FORCE EQUALIZED EXTERNAL STRIPPER FOR METALWORKING MACHINES AND THE LIKE

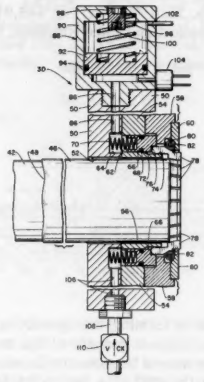
Elpidifor Paramonoff, Los Angeles, and Ralph M. Main, San Pedro, both of Calif., assignors to Standun, Inc., Compton, Calif.

Filed June 19, 1974, Ser. No. 480,620

Int. Cl. B21d *45/00*

U.S. Cl. 72—344 **26 Claims**

1. In a stripping device of the type wherein frames means mounts a multiplicity of circumferentially adjacent fingers about an axially reciprocal ram movable therethrough with said fingers engaging a leading edge of a tubular article on said ram and stripping said article from said ram during said ram movement; the improvements comprising: reactor means operably connected to each of said fingers for normally urging each of said fingers generally axially to a pre-set maximum forward position ready to be contacted by said article leading edge and exerting a minimum reactive force against each of said fingers during individual movement of each of said fingers rearwardly from contact of that finger by said article leading edge dependent on said article leading edge contour until substantially all of said fingers have been so contacted, said reactor means after substantially all of said fingers have been so contacted exerting a substantially immovable reactive force against all of said fingers collectively in the then individual



rearward movement positions of each of said fingers to cause said fingers collectively to strip said article.

3,886,782

HAND RIVETER

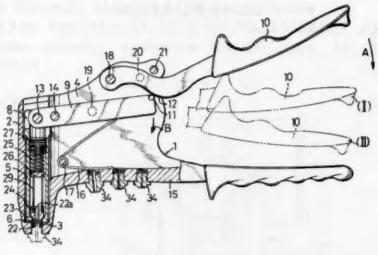
Ukio Miyamoto, Osaka, Japan, assignor to Vessel Tool Company, Ltd., Osaka, Japan

Filed July 8, 1974, Ser. No. 486,426

Claims priority, application Japan, July 19, 1973, 48-85202

Int. Cl. B21j *15/34*

U.S. Cl. 72—391 **2 Claims**



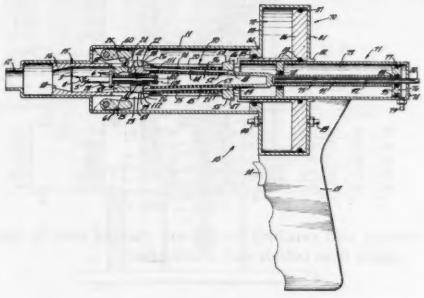
1. A hand riveter comprising divided jaws, a jaw spring for elastically pressing the jaws, a jaw pusher interposed between the jaws and the jaw spring to deliver the elastic force of the jaw spring to the jaws, a jaw case housing the jaws, the jaw spring and the jaw pusher and having a tapered bore for receiving the jaws in elastic contact wth the inner peripheral surface of the tapered bore, a fixed handle having at its head portion a hollow body acommodating the jaw case therein movably axially thereof, a nosepiece mountable from outside into the hollow body to open the jaws away from each other and movable handle means mounted on the jaw case to lift the jaw case and opposing the fixed handle, the movable handle means being composed of a first movable handle having a rolling member at its one end and a separate second movable handle in the form of a bell crank and formed at its base portion with a cam surface curved progressively gently rearward, the rolling member being substantially in elastic contact with the cam surface, the first and second movable handles being pivoted individually so as to serve as a double lever mechanism.

3,886,783

AUTOMATIC LOADING BLIND RIVETER

Richard F. Hirsch, 708 W. 38th St., San Pedro, Calif. 90731

Filed July 25, 1974, Ser. No. 491,929
Int. Cl. B21j 15/34
U.S. Cl. 72—391 15 Claims



1. A riveter for setting blind rivets of the type including a tubular sleeve having an annular head at one end thereof and a mandrel extending through the sleeve, the mandrel having an enlarged head adjacent the other end of the sleeve, said blind riveter comprising:

a housing adapted to be held stationary during operation of said riveter, said housing having a nose through which said rivets pass;

a first elongate, hollow slide member mounted for axial movement relative to said housing, one end of said first slide member being positioned adjacent said nose of said housing;

magazine means for feeding rivets laterally into said housing;

a second elongate, hollow slide member mounted for axial movement coaxially with and within said first slide member, one end of said second slide member being operative to contact said head of said rivet sleeve and to advance said rivet through said first slide member to a setting point beyond said one end of said first slide member and said nose of said housing, said rivet mandrel extending into the hollow center of said second slide member;

means connected to said housing for releasably locking said second slide member at said setting point with said one end thereof engaging said head of said rivet sleeve;

a pair of opposed jaw members carried by said second slide member and being mounted for limited axial and lateral movement relative thereto for releasably gripping said rivet mandrel; and

means at said one end of said first slide member for engaging said jaw members and for simultaneously urging said jaw members into firm gripping engagement with said rivet mandrel and pulling said jaw members axially, with said first slide member, away from said one end of said second slide member, thereby setting said rivet.

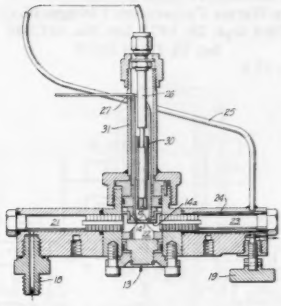
3,886,784

HIGH PRESSURE DEW AND FROST POINT INDICATOR

Robert S. Sheldon, Northridge, Calif., assignor to Air-Dry Corp., Northridge, Calif.

Filed Mar. 15, 1973, Ser. No. 341,589
Int. Cl. G01h 25/02
U.S. Cl. 73—17 A 5 Claims

1. A dew and frost point indicator for measuring the amount of water vapor in a sample gas stream, said indicator including cryostat means of the Joule-Thompson expansion process type, means for passing gas through said cryostat to expand said gas to atmospheric pressure to provide cold outlet gas from said tip, a mirror disposed in front of said tip, the flow of said cold gas being directed against the back of said mirror to chill said mirror, a sample chamber disposed in front of said mirror, said sample chamber being closed off from said cryostat, means for passing a sample gas stream through said sample chamber at ambient temperature, whereby frost is formed only on the front of said chilled mirror by condensation from the sample stream, means for optically observing the initital formation of frost on the front of said mirror, means for measuring the temperature of said mirror at the time of said initial formation of frost, said cryostat means including thin helically wound high pressure tubing, said tubing having cooling fins,



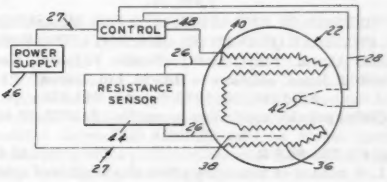
means for directing the output of said tip over said cooling fins for additional cooling, said tubing mounted within a tightly fit jacket, said cooling fins defining a helical path within said jacket and around said tubing, means for directing the cold output from said tip along said helical path to cool said fins and tubing, and means for supplying gas from said sample stream to said cryostat to operate said cryostat, said mirror comprising two adjacent concentric mirrors thermally insulated from each other, one of said mirrors being cooled by said cryostat and the other of said mirrors remaining at substantially ambient temperature.

3,886,785

GAS SENSOR AND METHOD OF MANUFACTURE

Henry L. Stadler; Tseng-ying Tien, both of Ann Arbor; Michael J. Esper, Detroit, and Donald J. Romine, Southfield, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 391,424, Aug. 23, 1973, which is a continuation of Ser. No. 198,515, Nov. 15, 1971, abandoned. This application Aug. 31, 1973, Ser. No. 393,698
Int. Cl. G01n 7/02, 31/00
U.S. Cl. 73—23 11 Claims



1. A sensor for sensing the partial pressure of oxygen comprising:

a porous, sintered ceramic sensor body having a modulus of rupture greater than about 11,000 psi;

a pair of electrodes embedded in said body and spaced apart so that at least a portion of the sensor body is interposed between said electrodes;

and electrical means connected to said pair of electrodes for responding to changes in the inter-electrode resistance;

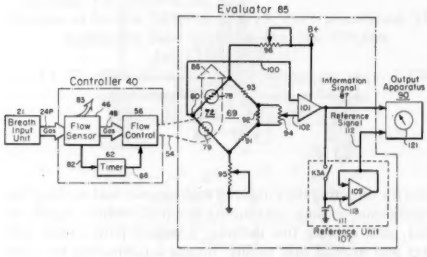
said porous sensor body being comprised of ceramic material having a density less than about 85% of theoretical density.

3,886,786

NULL MEMORY SYSTEM FOR A GAS ANALYSIS SYSTEM

Joseph P. Hoppesch, Streamwood; Donald H. Ward, Glen Ellyn, and James R. Tomashek, Wooddale, all of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Sept. 20, 1971, Ser. No. 181,805
Int. Cl. G01n *33/16*
U.S. Cl. 73—27 R **2 Claims**



1. In a gas tester of the type having a detector which receives gas samples and produces a d.c. signal whose maximum amplitude during a period of exposure to a sample is a function of certain gases contained in those samples, the improvement comprising:

means for storing and continuously reproducing over a period a single amplitude d.c. signal;

means for generating a reference d.c. amplitude signal from the detector just prior to the introduction of a sample of gas to be tested therein and for storing that generated reference signal on said signal storing means; and

means coupled to said signal storage means and to the detector for producing an output proportional to the difference in the outputs thereof,

whereby drift is minimized and accuracy of output is increased.

3,886,787

METHOD OF AND APPARATUS FOR MEASURING PHYSICAL QUANTITIES OF A ROTATING BODY

Toshio Akatsu, Tokyo, and Toshimitsu Fujiyoshi, Kashiwa, both of Japan, assignors to Hitachi, Ltd., Japan

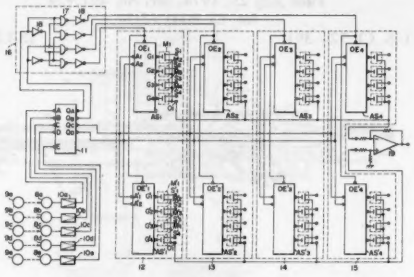
Filed Oct. 30, 1973, Ser. No. 411,176
Claims priority, application Japan, Nov. 2, 1972, 47-109409
Int. Cl. G01b *7/18*
U.S. Cl. 73—88.5 R **10 Claims**

1. A method of measuring physical quantities of a rotating body at many measuring points thereof, comprising

a step of converting said physical quantities to corresponding electrical signals by measuring devices provided at said measuring points;

a step of changing over switching circuits incorporated in said rotating body and connected with the output terminals of said measuring devices, in response to signals from outside or inside of said rotating body so as to sequentially deliver said electrical signals; and

a step of taking said sequentially delivered electrical signals out of said rotating body,



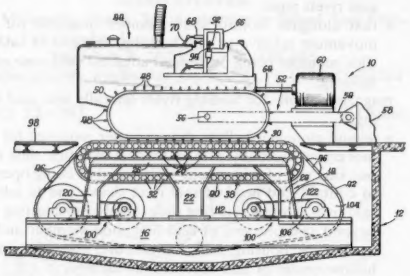
wherein said switching circuits are changed over by light signals from outside said rotating body.

3,886,788

TRACTOR TEST CELL

Harold W. Jeter, Jr., Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 4, 1973, Ser. No. 394,167
Int. Cl. G01l *5/13*
U.S. Cl. 73—117 **9 Claims**



1. A testing device for a vehicle having a ground-engaging drive mechanism comprising: a frame; an endless belt on which the ground-engaging drive mechanism of the vehicle may be disposed; means associated with the frame and belt for supporting the belt and the vehicle disposed thereon relative to the frame, and allowing the belt to travel along its length relative to the frame; and means for limiting movement of the so-disposed vehicle relative to the frame, and comprising the ground-engaging drive mechanism defining a plurality of projecting ground-engaging members, and wherein the belt defines a plurality of recessed areas sized and spaced so that the projecting members of the drive mechanism seat therein.

3,886,789

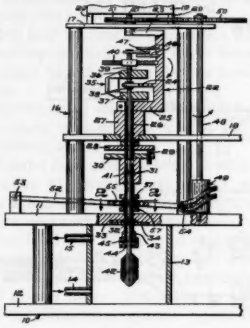
VISCOMETER

Donald W. Brookfield, 168 Massapoag Ave., Sharon, Mass. 02067

Division of Ser. No. 211,935, Dec. 27, 1971, abandoned. This application Aug. 31, 1973, Ser. No. 393,553
Int. Cl. G01n *11/16*
U.S. Cl. 73—59 **5 Claims**

1. A viscometer comprising a chamber, a motor, means positively driven by said motor and including first and second tubular shaft sections, means interconnecting said shaft sections in axial alignment with said second section axially movable relative to the first section, said second section extending into said chamber, said chamber provided with a seal through

which said second section extends and relative to which said second section is slidable and rotatable, a shaft extending through said tubular section and rotatable independently thereof, a torsional connection between said shaft and said



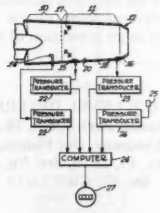
positively driven means outside said chamber, said shaft including a drag exposed in said chamber, a seal through which said shaft extends and carried by said second section, and means to reciprocate said second section.

3,886,790

APPARATUS FOR DETERMINING THE GROSS THRUST OF A JET ENGINE

Edelbert G. Plett, Belle-Mead, N.J., assignor to Control Data Canada, Ltd., Willowdale, Ontario, Canada

Filed Mar. 18, 1974, Ser. No. 452,278
Claims priority, application Canada, Apr. 27, 1973, 169738
Int. Cl. G01m *15/00*
U.S. Cl. 73—117.4 **3 Claims**



1. Apparatus for use in a jet type engine having a diffuser, a tailpipe, and a nozzle, for determining the total pressure at the entrance to the nozzle, comprising:

first pressure responsive means for detecting the total pressure P_{T5} in the diffuser and providing a first signal representative of said total pressure,

second pressure responsive means for detecting the static pressure P_{SN} at the nozzle entrance and providing a second signal representative of said static pressure,

third pressure responsive means positioned between the upstream side of the diffuser and the nozzle entrance and upstream of said second pressure responsive means, for detecting the static pressure P_{S6} and providing a third signal representative of said static pressure, and

computer means for combining said first, second and third signals to determine iteratively the nozzle total pressure P_{TN} according to the relationship

$$P_{TN} = \eta(P_{TN}, P_{T5}, P_{S6}, P_{SN}, C_1, C_2, \gamma, K_1)$$

where

C_1 is a dimensionless constant related to tailpipe geometry

C_2 is a dimensionless constant related to the fluid flow characteristics in the tailpipe,

γ is the means ratio of tailpipe gas specific heats, and

K_1 is a dimensionless constant used to obtain a prediction of the flameholder region total pressure,

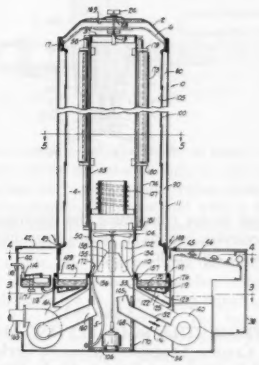
and to provide a fourth signal representing said nozzle total pressure P_{TN}.

3,886,791

CYCLIC TEST APPARATUS

Paul R. Grossman, Alliance, Ohio, assignor to Q-Panel Company, Cleveland, Ohio

Filed July 23, 1973, Ser. No. 381,910
Int. Cl. G01n *17/00*
U.S. Cl. 73—150 R **48 Claims**



1. A testing apparatus for simulating the effects of natural weathering comprising a housing adapted to have a test atmosphere or gas therein, a central axis, conduit means disposed in said housing and extending along said axis, means for mounting test panels or samples in equidistant relationship with and radially, outwardly of said conduit means, and means for circulating the atmosphere in said housing in one direction across and in functional engagement with said test panels or samples and the same atmosphere and in the opposite direction through said conduit means.

3,886,792

CONFORMAL PRESSURE TRANSDUCER FOR AMMUNITION TESTING

Nicholas D. Change, West Seneca, and Michael T. Riggs, Batavia, both of N.Y., assignors to PCB Piezotronics, Inc., Depew, N.Y.

Continuation-in-part of Ser. No. 234,017, March 13, 1972, abandoned. This application July 23, 1973, Ser. No. 381,700
Int. Cl. G01l *5/14*
U.S. Cl. 73—167 **11 Claims**

1. Apparatus for testing ammunition fired from a test body such as a gun barrel having an interior chamber for holding an unmodified ammunition cartridge and an access opening communicating with a portion of the outer wall surface of said cartridge said apparatus comprising:

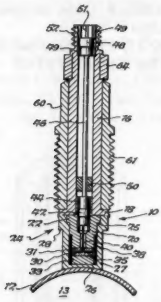
a. a housing adapted to be connected in the access opening of the test body;

b. piston means on one end of said housing and having a contoured end surface conforming to the outer surface of the ammunition cartridge;

c. piezolectric means within said housing and mechanically connected to said piston means;

d. whereby when said contoured end surface of said piston means firmly contacts and conforms to the outer surface

of the ammunition cartridge, pressure developed in response to firing of the cartridge is applied through the cartridge to said contoured end surface to deform said piezoelectric means to generate an electrical output signal proportional to the applied pressure; and



e. circuit means connecting the electrical output of said piezoelectric means to means providing information of pressure amplitude.

3,886,793

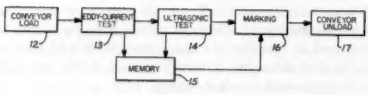
PROJECTILE BODY TESTING MACHINE

Henry E. Cramer, Loogootee; James M. Gerkin; Dale L. Groh, both of Bedford, and Gale A. Groh, Mitchell, all of Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 9, 1974, Ser. No. 432,021

Int. Cl. G01m *3/16*

U.S. Cl. 73—167 **7 Claims**



1. A machine for non-destructive testing of projectile bodies comprising,

a plurality of cradles each adaptable for holding one projectile body to be tested,

conveyor means for moving said plurality of cradles,

first means for raising a projectile body above its cradle for an eddy-current inspection test,

an eddy-current probe for applying an eddy-current test to said projectile bodies,

means for moving said eddy-current probe into a cavity in said raised projectile while said probe is rotating whereby said probe is moved in a helical pattern into and out of said cavity,

second means for raising a projectile body above its cradle and rotating said projectile body for an ultrasonic test,

an ultrasonic transducer for applying an ultrasonic test to a projectile body raised by said second means,

means for moving said transducer along the longitudinal axis of a projectile body raised by said second means,

memory means for indicating projectile bodies that are determined to be defective by said eddy-current inspection test and said ultrasonic test, and

means for marking projectile bodies that have been tested and determined to be sound.

3,886,794

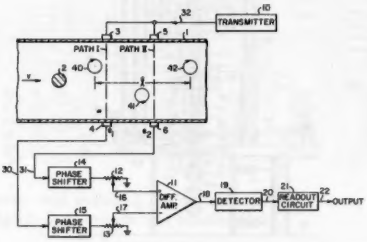
FLOWMETER APPARATUS AND METHOD

James L. McShane, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 11, 1974, Ser. No. 450,273

Int. Cl. G01f *1/00*

U.S. Cl. 73—194 B **27 Claims**



1. The method of measuring the velocity of relative movement between a fluid and an object immersed therein, said object creating periodic fluid disturbances in a pattern along a direction of disturbances, said periodic disturbances being characteristic of said velocity, said method comprising the steps of:

directing individual acoustic signals along at least two respective separate acoustic paths in the fluid at an angle to said direction of disturbances, and with at least one of said paths being through said disturbances;

receiving said acoustic signals after traveling along said paths whereby at least one acoustic signal is modulated by said periodic disturbances thereby to provide a signal having a modulation envelope;

combining the received acoustic signals into a combined signal of increased modulation index relative to the modulation index of the received acoustic signals;

and deriving a representation of the modulation of said combined signal as an indication of said velocity.

3,886,795

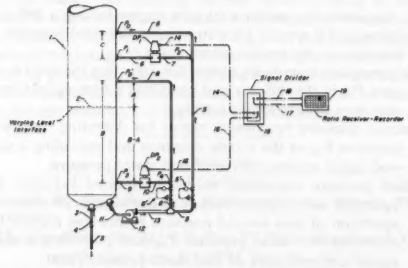
LIQUID INTERFACE LEVEL DETERMINING SYSTEM

Herbert Lytle Thompson, Park Ridge, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 19, 1973, Ser. No. 417,344

Int. Cl. G01f *23/14*

U.S. Cl. 73—299 **7 Claims**

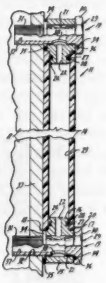


1. An apparatus system for locating an interface between liquids of different density that are collected within a confined chamber, with such system comprising in combination,

a. a first and second spaced apart levels of conduit connections to an upper portion of said chamber to provide pressure sensing contact with the lower density liquid at said two spaced levels;

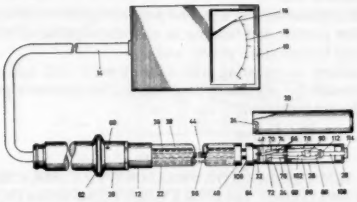
b. means connecting each of said levels for pressure sensing to a first differential pressure transmitting device;
c. a third level of conduit connection and of pressure sensing to said chamber at a position below said first spaced apart connections to said chamber to also be in contact with said lower density liquids;
d. a fourth level of conduit connection means and of pressure sensing connective to a lower level in said chamber for contact with the higher density liquid being collected therein;
e. means connecting said third and fourth connection levels for pressure sensing to a second differential pressure transmitting device;
f. liquid outlet means from a lower portion of said chamber connective to pump means and to additional conduit means which is connective to said conduit connections at said first and said third sensing levels, and to the higher pressure level side for each of said differential pressure transmitting devices to thereby add hydrostatic pressure from the higher density liquid to each such side;
g. signal divider means connective to said two devices to divide the differential pressure signals from said devices; and
h. a signal divider readout means to provide a ratio output reading which can be calibrated to indicate an interface position below said third level of pressure sensing.

3,886,796
LIQUID LEVEL GAUGE
Donald G. Gruett, Manitowoc, Wis., assignor to Oil-Rite Corporation, Manitowoc, Wis.
Filed Nov. 16, 1970, Ser. No. 89,701
Int. Cl. G01f *23/02*
U.S. Cl. 73—328 **4 Claims**



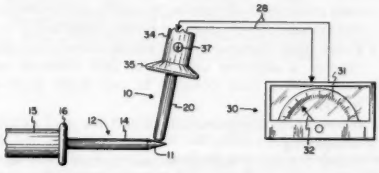
1. In a gauge for indicating the liquid level in a tank, a pair of vertically spaced hollow end members, the respective end members having a cylindrical projection extending therefrom in facing and axially aligned relation, said projections having an axial through bore communicating with the hollow interior of the corresponding end member and a circumferential groove exteriorly thereof, a rigid transparent plastic tubular sight member interposed between said end members and having a cylindrical bore adapted to receive the end member projections in opposed relation and said sight member comprising the sole connection between the opposed end members, said plastic tubular sight member being generally rectangular in section to provide greater material thickness at the respective corners to in effect provide for vertical columns along the respective edges corresponding to such corners to enhance the strength of the sight member, an O-ring seal disposed in the grooves of the respective end member projections and sealingly engaging with the tubular member to seal the connections between the tubular member and the respective end members, and hollow fastening means connecting at least one of said end members to the tank for mounting the gauge and placing the liquid contents of the tank in communication with the sight member.

3,886,797
DEVICE FOR MEASURING THE HUMIDITY OF GASES
Hans Bauer, Fuchsweg 2, 782 Titisee-Neustadt, Germany
Filed Oct. 18, 1973, Ser. No. 407,462
Int. Cl. G01n *25/64*
U.S. Cl. 73—335 **28 Claims**



1. A device for measuring the humidity of gases, comprising, in combination: probe means including two closed chambers, at least the first or "wet" chamber being made at least in part of a gas-permeable filter material with a pore size allowing water molecules in the air to pass freely, thus constituting means for equalizing air humidity in said first chamber with that of the outside, and for preventing outer air streams to reach said first chamber, the second chamber being a "dry" chamber; a supply tank for an evaporating liquid, a porous evaporator body in said first chamber, two temperature-sensitive electric resistors, respectively disposed in said chambers, and means for substantially uniformly supplying said liquid to said evaporator body which latter surrounds a first one of said resistors; a voltage source and an electrical circuit for passing a noticeable current through at least said first resistor so as to increase its temperature, said circuit including electric differentiating means for comparing the resistance values of said resistors; indicator means connected to the latter for reading therefrom humidity values of a gas in the neighborhood of said probe in proportion to the established resistance values; an absorbent rod in said supply tank extending towards the rear of said probe means; a collecting receptacle at the end of said supply tank opposite to that having said chambers thereat; a pressure-compensating capillary connecting said supply tank with said receptacle; and an aerating tube leading from said receptacle to the outside, at a point where possibly exiting liquid does not cause any disturbance.

3,886,798
TEMPERATURE PROBE
William S. Fortune, 14250 Dearborn St., Panorama City, Calif. 91402
Filed Aug. 22, 1973, Ser. No. 390,591
Int. Cl. G01k *1/14*
U.S. Cl. 73—343 R **3 Claims**



1. A temperature probe and fixture for measuring the temperature of a soldering instrument at the tip thereof during soldering, said temperature probe including:

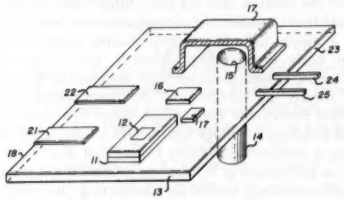
a. a thermocouple having a junction for measuring the temperature;
b. an outer metallic tube surrounding said thermocouple;
c. a button closing one end of said tube and consisting of a metal capable of being coated with a soldering compound; and
d. a fixture for securing said temperature probe to the soldering instrument, said fixture having a first portion capable of being attached to the soldering instrument;
e. means on said first portion for clamping it to the soldering instrument;
f. said fixture having a second portion rigidly secured to said first portion and bearing an element capable of receiving said temperature probe; and
g. means cooperating with said element and said second portion for adjustably securing said temperature probe to the soldering iron.

3,886,799

SEMICONDUCTOR PRESSURE TRANSDUCER EMPLOYING TEMPERATURE COMPENSATION CIRCUITS AND NOVEL HEATER CIRCUITRY

Richard J. Billette, Dublin, and John Vennard, Los Altos, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Sept. 24, 1973, Ser. No. 399,937
Int. Cl. G01l *9/04*
U.S. Cl. 73—398 AR **10 Claims**



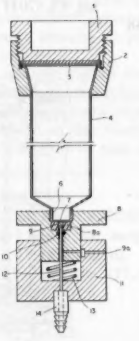
1. A semiconductor pressure transducer apparatus comprising
a semiconductor body comprising a substrate and a surface layer of a material of a first conductivity type, said body having a cavity region formed therein, said cavity region including a thin wall section formed by a section of said surface layer, said thin wall section being flexible responsive to pressure exerted across said thin wall section,
an electrical bridge circuit formed in said thin wall section of said surface layer and comprising four resistor arms, two opposed nodes of said bridge forming a bridge input, the two other opposed nodes of said bridge forming a bridge output, each of said bridge resistors being formed by a diffusion of a dopant of opposite conductivity type to that of the surface layer into said thin semiconductor wall section,
circuit means for applying a voltage to the input nodes of said bridge circuit, said circuit means including a common collector node formed by said layer of said semiconductor material of said first conductivity type,
a Zener diode formed in said surface layer comprising an emitter, a collector coupled to said common collector node, and a base coupled to one input node of said bridge,
a temperature compensation circuit for said Zener diode comprising
a first transistor formed in said surface layer having an emitter coupled to the emitter of said Zener diode, a base, and a collector coupled to said common collector node, and a pair of resistors coupled in series between said common collector node and the emitter of said first transistor, the junction node between said two resistors being coupled to the base of said first transistor,
a temperature compensation circuit coupled between another input node of said bridge and said common collector node comprising
a second transistor formed in said surface layer having an emitter coupled to said other bridge input node, a collector coupled to said common collector node, and a base, and
a pair of resistors coupled in series between said common collector node and the emitter of said second transistor, the junction node between said two resistors being coupled to the base of said second transistor, and
a heating circuit thermally well coupled to the piezoresistor bridge for heating the thin wall section for the cavity region comprising a transistor formed in said thin wall section comprising
a base region diffused in said surface layer,
an emitter diffused in said base region, and
a collector region common to said common collector node, said base and emitter region having output leads to which energy pulses may be applied to heat the thin semiconductor wall section.

3,886,800

GAS SAMPLING DEVICE

John R. Boehringer, 427 Parkview Dr., Wynnewood, Pa. 19096

Filed Oct. 15, 1973, Ser. No. 406,235
Int. Cl. G01n *1/24*
U.S. Cl. 73—421.5 R **15 Claims**



1. Gas sampling device comprising a sealed crushable tube having a puncturable segment therein, an opening closed by a resealable, openable closure and a piston snugly fitting within said tube and removable through said opening, said tube, said closure, and said piston all being composed of a material inert and non-absorbent with respect to any gases to be tested.

3,886,801

DECOMPRESSION METER

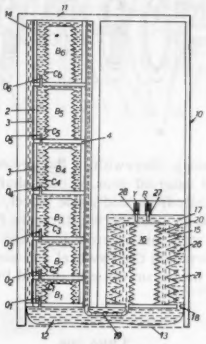
Brian Andrew Hills, Bembridge, England, assignor to National Research Development Corporation, London, England

Filed Oct. 30, 1973, Ser. No. 411,043
Claims priority, application United Kingdom, Oct. 30, 1972, 50003/72
Int. Cl. G06g *5/00*
U.S. Cl. 73—432 R **8 Claims**

1. A decompression meter as hereinbefore defined, comprising:
a. first means responsive to the ambient total pressure for generating a first liquid pressure signal;

b. second means responsive to the ambient total pressure for generating a varying second liquid pressure signal which represents the solution pressure of oxygen and nitrogen in body tissue and has a value representative of the local partial pressure of a dissolved gas in capillary blood and a rate of change proportional to said ambient total pressure for simulating gradual absorption of a gas in solution in body tissue, said second means comprising analogue means for simulating gradual absorption of oxygen and nitrogen in solution in body tissue at various radially successive concentric annuli of body tissue around a capillary blood vessel;

c. third means responsive to said first and second liquid pressure signals for sensing in the analogue of each of said



annuli a condition of excess of the value of said second signal over the value of said first signal; and

d. fourth means responsive to said excess condition to simulate liberation of a dissolved gas as gaseous phase in body tissue and for generating a third signal to indicate the presence of said gaseous phase, said fourth means being constructed to sense excess over said first signal of a predetermined fraction of the second signal which fraction corresponds to the partial pressure of nitrogen in solution in the body tissue as a fraction of the total solution pressure of oxygen and nitrogen in the tissue;

e. said third means being adapted to sense local excess of said predetermined fraction of said second liquid pressure signal in the analogue of each of said radially successive annuli over said first signal.

3,886,802

MULTISPEED TIMER DRYER CONTROL

Anthony Mason, Saint Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 29, 1973, Ser. No. 364,731

Int. Cl. F16h *3/76, 5/06, 55/04;* **H01h** *7/08;* **F16d** *19/00*

U.S. Cl. 74—3.5 **9 Claims**

1. For use in a clothes dryer, a multispeed timer appliance control comprising:

a timer motor;

at least one rotatably mounted control cam for controlling dryer operation; and

a gear train connecting said timer motor and said cam in driving engagement, said gear train including

a first gear connected to rotate said cam,

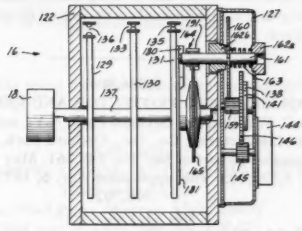
a shaft mounted for rotation and axial displacement;

a second gear mounted on said shaft for engagement with said first gear, said second gear including a first section having a first number of teeth and a second section axial displaced from said first section and having a second number of teeth, and

cam means movable with said first gear to cam and displace said shaft to shift the gear ratio of said gear train by engaging and disengaging said first gear and the first and second sections of said second gear,

whereby said first gear is rotated at a first speed when said first section of said second gear is in engagement with said first gear and at a second speed when said second section of said second gear is in engagement with said first gear, said first and second speeds differing by said shift in gear ratio.

5. In a timer appliance control for a clothes dryer, said timer having a dial control knob and a camstack of a plurality of cams is mounted on a rotatable shaft and driven through a control program by a timer motor via a gear train, the improvement therein of means for driving the camstack at different speeds, comprising:



a first gear in the gear train connected to the shaft; a second gear in the gear train including at least first and second axially disposed sections having different numbers of teeth for engagement with the teeth of said first gear; means mounting one of said first and second gears for axial movement relative to the other; and

means operable to displace the axially movable gear to shift the gear ratio betwen said first and second gears,

whereby said first gear is rotated at a first speed when said first section of said second gear is in engagement with said first gear and at a second speed when said second section of said second gear is in engagement with said first gear, said first and second speeds differing by said shift in gear ratio.

3,886,803

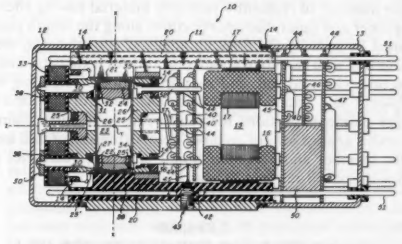
FLUID BEARING GYROSCOPE

Peter E. Jacobson; Arthur W. Lane, and Paul E. Ashley, all of Phoenix, Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 6, 1973, Ser. No. 348,546

Int. Cl. G01c *19/18*

U.S. Cl. 74—5.6 D **20 Claims**



1. A gyroscopic apparatus for navigable craft comprising housing means having a longitudinal axis and a sealed internal cavity formed therein by axial fluid thrust bearing surfaces and a cylindrical magnetic saturation ring enclosing said thrust bearing surfaces,

rotor means having external surfaces which conform to the internal surfaces of said cavity but of slightly smaller

over-all dimensions for providing a hydrodynamic bearing gap whereby upon rotation said rotor means is hydrodynamically suspended within said sealed cavity,

stator means disposed within said housing and displaced from said sealed internal cavity along said longitudinal axis for producing a rotating magnetic field, and

magnetic coupling means perimetrically disposed with respect to said stator means and said rotor means for providing a flux path between said stator means and said rotor means for the lines of flux in said rotating magnetic field whereby said rotor rotates about said longitudinal axis in response to said rotating magnetic field, contaminants produced by said stator means are prevented from entering said internal sealed cavity, and said stator means is removable from said housing means without disassembling said sealed internal cavity or said magnetic coupling means.

3,886,804

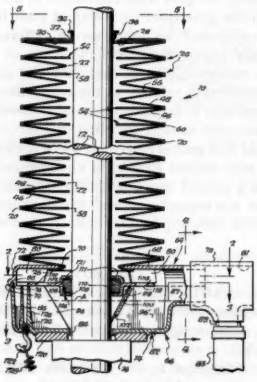
POLISHED ROD PROTECTOR AND RECEIVER

Mason C. Winfield, Jr., Orchard Park, N.Y., assignor to Rodgard Manufacturing Co., Inc., Orchard Park, N.Y.

Continuation-in-part of Ser. No. 249,261, May 1, 1972, Pat. No. 3,796,103. This application Apr. 6, 1973, Ser. No. 348,702

Int. Cl. F16j *15/50*

U.S. Cl. 74—18.2 **10 Claims**



1. A polished rod protector comprising; in combination with a polished rod mounted for reciprocation, an elongated extensible member of resiliently yieldable material having alternating inner and outer diameter portions along the length thereof joined by radial walls forming adjacent convolutions, means mounting said member about said rod for extension and retraction with said rod, and support members extending from adjacent said outer diameter portions inwardly beyond said inner diameter portions for reinforcing said outer diameter portions against inward collapse upon extension of said extensible member and also maintaining said inner diameter portions in spaced relation to said rod.

3,886,805

CRANK GEAR FOR THE CONVERSION OF A TRANSLATIONAL MOTION INTO ROTATION

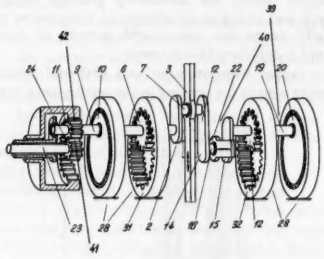
Ivan Koderman, Nadgorica/Jeza 95 61231 Lubliana, Crnuce, Yugoslavia

Filed Apr. 9, 1974, Ser. No. 459,281

Int. Cl. F16h *37/12*

U.S. Cl. 74—52 **4 Claims**

1. A crank gear for converting linear motion of at least two connecting rods arranged in a 90° relationship to each other and coupled together according to the Cardan principle into rotary motion comprising, a housing, an internal gear fixed within the housing, an eccentric planetary crankshaft within said housing, a crankpin on said crankshaft journaling each of said connecting rods, an external gear rigidly secured on said crankshaft which hobs with said internal gear, a guide wheel having a diameter equal to the pitch diameter of said external



gear and concentric therewith, a flange on the guide wheel secured to said external gear, a butt shaft secured to and extending coaxially from said guide wheel, a flywheel eccentrically mounted on said butt shaft, means fixed to said housing concentric with said internal gear and surrounding said flywheel for journaling the flywheel and supporting said butt shaft, and gear means on the end of said butt shaft for takeoff of power.

3,886,806

OPERATING LEVER FOR ACTUATING A GEAR-SHIFTING MEANS MOUNTED ON A BICYCLE

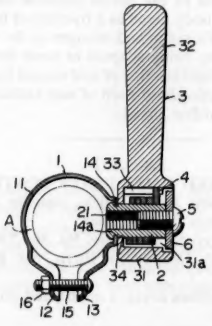
Masashi Nagano, Osaka, Japan, assignor to Shimaro Industrial Co., Ltd., Japan

Filed May 22, 1973, Ser. No. 362,845

Claims priority, application Japan, July 20, 1972, 47-72909; July 20, 1972, 47-72910; July 20, 1972, 47-72911

Int. Cl. G05g *5/16;* **F16d** *49/02*

U.S. Cl. 74—491 **12 Claims**



1. An apparatus for operating a gear-shifting means for bicycles comprising an operating lever, a control cable connected to said operating lever and arranged to be connected to the gear shifting means, a return spring associated with said control cable for returning said gear shifting means to a certain position, said operating lever arranged to pull said control cable against the action of said return spring for releasing the cable and shifting the gear shifting means, said operating lever comprising a fixed shaft unrotatably mounted to a bicycle through a fixture means, a lever body rotatably supported on said fixed shaft and connected to one end of said control cable, a spring means fastened around said fixed shaft, having one end retained by said lever body and the other end kept in

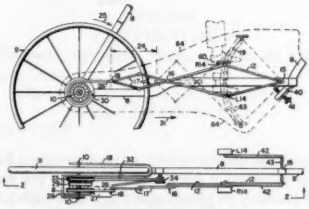
slidable contact with said fixed shaft, said spring means being formed, when in released state, to have a smaller inner diameter than the outer diameter of said fixed shaft and adapted to be fastened around said shaft in the direction where it can be released when moved against said return spring, and said spring means arranged for maintaining said lever body against said return spring in a position where said lever body has been moved for shifting said gear shifting means.

3,886,807

BICYCLE OPERATING MEANS

Robert P. Ellis, 350 Lomas Santa Fe Dr., Solana Beach, Calif. 92075

Filed Sept. 17, 1973, Ser. No. 397,641
Int. Cl. G05g *1/04*
U.S. Cl. 74—521 **8 Claims**



1. In a bicycle or similar vehicle, a means for manually propelling same, said means comprising a lazy-tong mechanism a front horizontally extending joint thereof being attached to the frame of said bicycle, the substantially vertically disposed joints of said lazy-tong mechanism having foot pedals pivotally attached thereto, and the rear horizontally disposed joints being attached to a U-shaped rack, the arms of said U-shaped rack being slightly flexible and the inwardly projecting edges thereof being provided with sharp pointed teeth, the teeth on the upper arm being inclined forwardly while the teeth on the lower arm are inclined rearwardly, and an extending axle on the rear wheel of said bicycle, a pinion secured to said axle, the said pinion having teeth on its periphery, said teeth being inclined to mesh with the teeth of the U-shaped arms when either of said arms contact said pinion and to slide over said teeth on said pinion when the teeth of the opposite arm is in mesh with the teeth of said pinion.

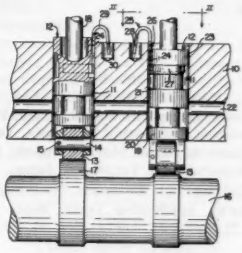
3,886,808

ENGINE VALVE LIFTER GUIDE

Robert L. Weber, Lacon, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 318,518, Dec. 26, 1972. This application Sept. 26, 1973, Ser. No. 401,068
Int. Cl. F16h *53/06*
U.S. Cl. 74—569 **5 Claims**

5. A one-piece guide in combination with a spool member reciprocally mounted in a support member, said spool member having a longitudinally disposed first guide means and a circumferentially disposed second guide means thereon, said guide comprising a first guide portion disposed in said first guide means, a pair of arcuately shaped second guide portions extending from said first guide portion and disposed in said second guide means, and anti-rotation means for preventing



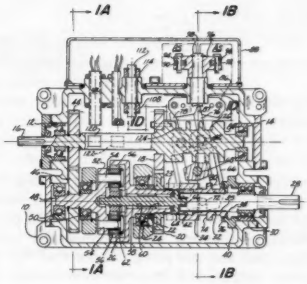
rotation of said spool member relative to said support member.

3,886,809

POSITIVE DRIVE CONTINUOUS GEAR MESH SHIFTING TRANSMISSIONS

Laszlo J. Kiss, 7044 Paige, Warren, Mich. 48091

Filed Aug. 7, 1972, Ser. No. 278,377
Int. Cl. F16h *37/06, 37/00, 3/38, 35/02*
U.S. Cl. 74—681 **35 Claims**



1. A positive constant gear-mesh positive clutch speed change system for a primary drive system having a primary input member, at least two primary output ratio determining members, and a primary output driven member selectively alternatively connected with said ratio determining members for first and second determined output rotational values, said speed change system comprising a planetary ratio alternator drive system and an automatic mechanical shifter system both drivingly connected with said primary input member at least during ratio changes, wherein:

a. said planetary ratio alternator drive system comprises a planetary input member, a planetary output member and a planetary reaction member constantly operably connecting the planetary input and output members, their relative ratios and output speeds being determined by the rotational value of said reaction member, and means continuously driving said reaction member alternately between minimum and maximum rotational value functions to effect continuous alternate rotation of said planetary output member between rotations synchronous with said ratio determining members; and

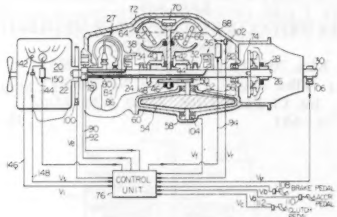
b. said shifter system comprises means effecting selective operative connection of said primary output driven member with said ratio alternator planetary output member synchronously with said ratio alternator drive system functions for changing the primary input to output member relative ratios.

19. The system as in claim 1 including reduction gearing constantly drivingly connected with and intermediate said primary input member and said ratio alternater planetary input member.

3,886,810
HYBRID POWER SYSTEM

Hiroshi Sugiyama, Hiratsuka; Toshio Hirota, Yokohama; Jun Kakei, Yokohama, and Yoshiji Kabasawa, Yokohama, all of Japan, assignors to Nissan Motor Company Limited, Takara-machi, Kanagawa-ku, Yokohama, Japan

Filed Sept. 21, 1973, Ser. No. 399,373
Claims priority, application Japan, Sept. 22, 1972, 47-94592; Sept. 22, 1972, 47-94593; Oct. 31, 1972, 47-108506
Int. Cl. F16h *33/02*
U.S. Cl. 74—751 **5 Claims**

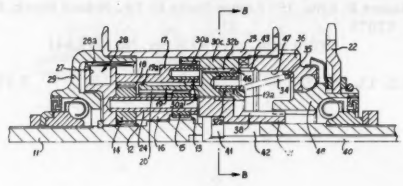


1. A hybrid power system for a motor vehicle, comprising a prime mover, a power output shaft, an intermediate shaft connected between said prime mover and said power output shaft, releasable coupling means connected between said intermediate shaft and said power output shaft for disconnecting the power output shaft from the intermediate shaft when the coupling means is actuated, a flywheel releasably engaging said intermediate shaft, a stepless speed change unit interconnected between said flywheel and said intermediate shaft for steplessly varying a ratio between the revolution speeds of said intermediate shaft and said flywheel, and control means responsive to revolution speeds of said prime mover and said flywheel for producing a first signal representative of an amount of energy stored on said flywheel and a second signal representative of a differential speed between said prime mover and said flywheel, said control means comprising a signal generator which produce a first control signal when said first signal is representative of a flywheel energy larger than a first reference level, a second signal when said first signal is representative of a flywheel energy larger than a second reference level which is higher than said first reference level, and a third control signal when said first signal is representative of a flywheel energy larger than a third reference level which is higher than said second reference level, wherein the power output from said prime mover is imparted partly to said power output shaft and partly to said flywheel for increasing the energy on the flywheel when said second signal is smaller than a predetermined level and concurrently said first control signal is present and wherein said flywheel is disengaged from said prime mover in response to said third control signal and is brought into driving engagement with said power output shaft through said coupling means in response to said second control signal so that the power output shaft is driven from both said prime mover and said flywheel when the second control signal is present.

3,886,811
EPICYCLIC CHANGE SPEED HUBS

Anthony William Hillyer, Loughborough, England, assignor to Raleigh Industries Limited, Nottingham, England

Filed Mar. 11, 1974, Ser. No. 449,773
Claims priority, application United Kingdom, Mar. 28, 1973, 14826/73
Int. Cl. F16h *5/42, 57/10, 5/04*
U.S. Cl. 74—750 B **16 Claims**



1. An epicyclic change-speed hub comprising a hub axle, a hub shell a plurality of sun gears secured to the said axle, a respective plurality of planet gears for each such sun gear, a respective gear ring for each plurality of planet gears, each plurality of planet gears being in mesh with its respective sun gear and with its respective gear ring, the respective pluralities of planet gears being supported on a common planet cage, respective unidirectional clutch means drivingly connecting each gear ring and the planet cage with the hub shell and an axially adjustable coupling means adapted to receive a drive motion from an input member and selectively cooperable with the planet cage or with one of the gear rings for transmitting a drive motion thereto, one of said gear rings being axially shiftable with respect to the hub and being adapted according to its position in the axial direction of the hub to render inoperative a first unidirectional clutch means connecting said axially adjustable gear ring with the hub shell and also able to render a second unidirectional clutch means associated with said fixed ring inoperative, and coupling means between said common planet cage and said axially adjustable coupling means being adapted automatically to be mutually disengaged, if in a condition of engagement on reverse motion of the coupling means.

3,886,812
MARKING APPARATUS INCLUDING A VERTICAL COLUMN SERVING FOR GUIDING AND HOLDING A MARKING ARM

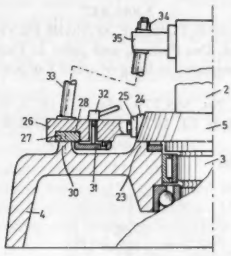
Franz Freund, Aschaffenburg, Germany, assignor to Mora Fabrik fuer Mebgeraete H. Freund, Germany

Filed Jan. 28, 1974, Ser. No. 436,907
Claims priority, application Germany, Jan. 30, 1973, 2304401
Int. Cl. B23b *29/00*
U.S. Cl. 74—813 L **20 Claims**

1. A marking apparatus of the type in which an apparatus arm is mounted on a vertical column having the bottom end thereof rotatably mounted in a base plate and lockable by a locking means at selected rotary positions with respect to said base plate, said apparatus comprising:

a guide rail spaced outwardly from the bottom of said column;

a radial arm secured at one end to said column and extending outwardly therefrom to engage said guide rail; and



an oblique strut extending from an upper portion of said column to said radial arm.

3,886,813

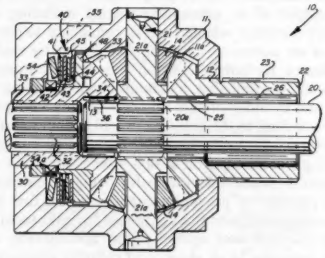
DIFFERENTIAL

Jerry F. Baremor, Marshall, Mich., assignor to Eaton Corp., Cleveland, Ohio

Filed Apr. 10, 1974, Ser. No. 459,631

Int. Cl. F16h *1/44*

U.S. Cl. 74—710.5 **6 Claims**



1. Apparatus comprising a pair of output drives, a differential interposed between said output drives and enabling differential rotation to occur between said output drives upon different loads being applied thereto, said differential comprising differential gearing drivingly connected with said output drives and including gears which are relatively rotatable to provide said differential rotation of said outputs, and means responsive to a predetermined degree of differentiating action of said differential gearing to lock up said differential gearing and releasable upon a predetermined torque being applied to said differential gearing due to windup of said output drives when said differential gearing is locked up.

3,886,814

COOLING CIRCUIT FOR A VEHICLE TRANSMISSION

David E. Bullard, Washington, and Jan K. Allen, Chillicothe, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 14, 1973, Ser. No. 388,189

Int. Cl. F16h *47/08*; **F16d** *33/00*

U.S. Cl. 74—730 **7 Claims**

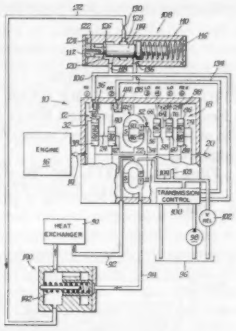
1. In combination with a transmission including working fluid and a torque converter, rotatable at relatively higher and lower speeds:

a heat exchanger;

first means communicating the working fluid with the heat exchanger so that rotation of the torque converter causes flow of the working fluid from the transmission to the heat exchanger through the first communicating means, through the heat exchanger, and back to the transmission, a higher rate of rotation of the torque converter increasing such flow;

fluid pressure means; and

second means communicating the working fluid with the heat exchanger so that the fluid pressure means cause flow of the working fluid from the transmission to the heat exchanger through the second communicating means, through the heat exchanger, back to the transmission only upon the rate of rotation of the torque converter falling below a chosen level,



wherein the second communicating means comprise valve means actuatable to provide such communication through the second communicating means only upon the rate of rotation of the torque converter falling below the chosen level to allow said fluid pressure means to cause flow of the working fluid from the transmission to the heat exchanger through the second communicating means, through the heat exchanger, and back to the transmission.

3,886,815

MULTI-SPEED REVERSIBLE GEARING

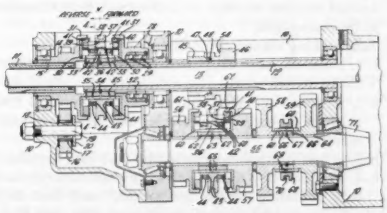
Thomas Eastwood, Huddersfield, England, assignor to David Brown Tractors Limited, Meltham, Huddersfield, England

Filed Apr. 29, 1974, Ser. No. 464,952

Claims priority, application United Kingdom, May 18, 1973, 23696/73

Int. Cl. F16h *3/02*

U.S. Cl. 74—745 **5 Claims**



1. A gearbox comprising forward and reverse gearing including a synchromesh clutch and connecting an input shaft to an intermediate shaft; multi-range gearing connecting the intermediate shaft to a layshaft parallel to the intermediate shaft, said multi-range gearing comprising a cluster of two

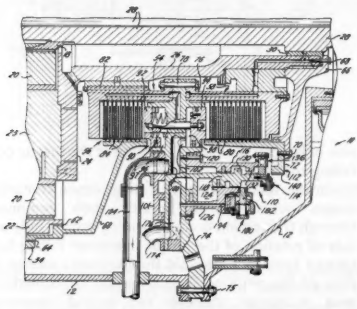
gears of mutually different pitch circle diameters slideable on splines on the intermediate shaft so that one of said gears can be brought into mesh with one gear secured on or integral with the layshaft or alternatively the other of said gears can be brought into mesh with another gear secured on or integral with the layshaft; and variable-speed gearing connecting the layshaft to an output shaft parallel to the layshaft and comprising a plurality of gears of mutually different pitch circle diameters secured on or integral with the layshaft and consisting of or including those gears on said shaft forming part of the multi-range gearing gears rotatably mounted on the output shaft and each meshing constantly with one of the gears on the layshaft, and clutch means for selectively connecting one of the gears rotatably mounted on the output shaft driveably to said shaft.

3,886,816

BIDIRECTIONAL PLANETARY GEAR TRANSMISSION

Angelo De Feo, Totowa Boro, and Harry N. Price, Elmwood Park, both of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Oct. 1, 1973, Ser. No. 402,295
Int. Cl. F16h *57/10, 37/06*
U.S. Cl. 74—764 **5 Claims**



1. In a bidirectional planetary gear transmission having a housing, an output means connected to the planetary gear assembly disposed in the housing to be rotatively driven by the planetary gear assembly alternately in opposite directions by arresting alternately the planetary gear carrier and the ring gear of the planetary gear assembly and having pressurized fluid friction brake mechanism operative from a disengaged position to an engaged position wherein the planetary gear carrier is connected to the housing to be thereby arrested and cause the planetary gear assembly to effect rotation of the output means in a predetermined direction, the combination of:

a. a locking means operative in an engaged position to secure the planetary gear carrier to the housing and against rotation thereby permitting said brake mechanism to be disengaged;

b. said locking means comprising:

b-1. a first member supported by the housing for reciprocative movement;

b-2. a second member connected for conjoined rotation with the planetary gear carrier and relative to said first member;

b-3. a first stop means carried by said first member;

b-4. a second stop means carried by said second member;

b-5. actuating means for moving said first member relative to said second member so that said first stop means is brought into rotative alignment with said second stop means to thereby prevent rotation of said second member and gear carrier; and

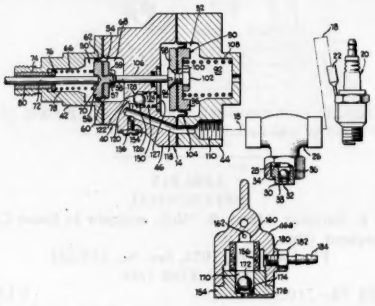
b-6. pilot means carried by said first member and coacting with said first and second stop means to guide said first and second stop means into rotative alignment and abutment to prevent rotation of said second member and said planetary gear carrier.

3,886,817

ENGINE TORQUE SENSOR DEVICE

Howard C. Paul, Des Plaines, and John J. Tuzson, Evanston, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 365,779, May 31, 1973. This application July 12, 1974, Ser. No. 487,830
Int. Cl. B60k *23/02*
U.S. Cl. 74—861 **5 Claims**



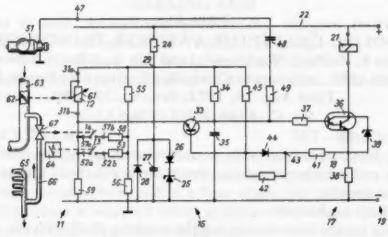
1. A mechanism for developing a signal responsive to engine torque output of an automotive engine including a torque responsive actuator adapted to be connected to the control system of an automatic transmission driven by said engine, said actuator including a piston movable to transmit said signal to said transmission, a conduit connecting said piston to at least one cylinder of said engine whereby said piston will move in response to the pressure in said cylinder as an indication of torque load, and said actuator including a safety device comprising a second piston in operative association with said first piston, said second piston also being connected to said cylinder pressure to prevent actuation of said first piston by said second piston, and biasing means for said second piston adapted to move said second piston and thereby said first piston in response to an absence of cylinder pressure so as to provide a high torque load indication to said transmission.

3,886,818

CONTROL SYSTEM FOR THE MAIN CONTROL PRESSURE OF A MOTOR VEHICLE AUTOMATIC TRANSMISSION

Bert Wurst, Moglingen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Sept. 17, 1973, Ser. No. 397,760
Claims priority, application Germany, Oct. 14, 1972, 2250440
Int. Cl. B60k
U.S. Cl. 74—866 **18 Claims**



1. A control system for controlling the main control pres-

sure of the automatic transmission of an internal combustion engine, comprising:

a source of electric voltage;

input transducer means (**11**) for converting mechanical position into electrical signals including a variable resistance, the ohmic value of which is controlled by the position of the engine throttle (**62**), said variable resistance (**12**) having a non-linear relation between resistance and throttle position, whereby said input transducer has a predetermined non-linear relation between input magnitude and output magnitude;

amplifying evaluation circuit means (**15**) responsive to said input transducer means (**11**), and

output transducer means (**19**) controlled by the electrical output of said evaluation circuit means (**15**) for mechanically controlling said main control pressure.

3,886,819

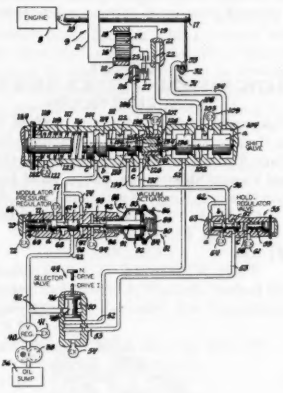
TRANSMISSION SHIFT CONTROL

Carl A. Lentz, Mooresville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 5, 1973, Ser. No. 412,866

Int. Cl. B60k *21/00*

U.S. Cl. 74—868 **13 Claims**



1. a transmission; multiratio gear means having an input, output, low drive fluid operated means for establishing a low ratio drive between said input and output and high drive fluid operated means for establishing a high ratio drive between said input and output; a source of fluid under pressure; governor means connected to said source and said output providing a governor pressure varying with output speed; torque demand means responsive to engine torque demand providing a torque demand signal varying with torque demand; shift control means including a bore and shift valve means movable in said bore connected to said source, said low and high drive means, said governor means and said torque demand means, operative in a downshift position to connect said source to said low drive fluid operated means, operative in an upshift position to connect said source to said high drive fluid operated means and biased in an upshift direction by said governor signal and having torque demand biasing means movable in said bore connected to said torque demand means and responsive to said torque demand signal operative in a downshift position to engage and provide an upshift resisting bias to said downshifted shift valve means and in an upshift position to engage and provide a downshift bias to said upshifted shift valve means for automatic shifting at increasing and higher upshift speeds and lower downshift speeds with increasing torque demand, said shift valve means and said biasing means having engaging end portions within said bore; and manual downshift means having downshift area means on said engaging end portions and manual downshift fluid supply means selectively manually controlled to supply downshift pressure to said bore to act on said downshift area means of said biasing means to hold said biasing means in said upshift position, to act on one area said downshift area means of said shift valve means when said shift valve means is upshifted to downshift said shift valve means at a higher speed than said automatic downshift, and to act on said downshift area means of said shift valve means when said shift valve means is downshifted to prevent an upshift until a speed substantially higher than said manual downshift speed.

13. In a transmission; multiratio gear means having an input, an output and fluid operated means for selectively establishing a low ratio drive and a high ratio drive; source means providing fluid under pressure; governor means connected to said gear means providing a governor signal varying with speed; torque demand signal means responsive to engine torque demand providing a torque demand signal varying with torque demand; shift control means operatively connected to said source means, said governor means, said torque demand signal means and said fluid operated means controlled by said governor signal and torque demand signal for automatic upshifting at higher speeds with increasing torque demand to upshift position and downshifting at lower speeds to downshift position and operative to control the supply of fluid between said source and said fluid operated means to establish said low ratio drive in downshift position and said high ratio drive in upshift position; said shift control means including a shift valve assembly having a bore, a shift valve element and a control valve element both slidable in said bore between upshift and downshift position and each having an adjacent end portion, governor bias means responsive to said governor signal to bias said shift valve element to upshift position, torque demand biasing means responsive to said torque demand signal biasing said control valve element to downshift position and to continuously engage said adjacent end portions for movement of said valve elements as a unit during said automatic shifting; manual downshift signal means manually selectively providing a manual downshift fluid pressure to said bore between said adjacent end portions in all positions of said valve elements; and downshift means having controlled area means with a first area means exposed to pressure in said bore at all times and a second area means on said adjacent end portion of said shift valve element, area control means with a third area means on said adjacent end portion of said control valve element, a restricted exhaust from said second area means, restriction means for flow from said first area means to said second area means having a more restricted passage than said restricted exhaust when said shift valve is upshifted and a less restricted passage than said restricted exhaust when said shift valve is downshifted and operative in response to said downshift pressure in said bore acting on said third area means to position said control valve element in said upshift position to provide when said shift valve element is in upshift position downshift pressure acting on said first area means, flowing through said more restricted passage over said second area means and to said restricted exhaust to provide not more than a low pressure acting on said second area means for a small downshift bias and to provide when said shift valve element is in downshift position downshift pressure acting on said first area means and flowing through less restricted passage, over said second area means and to said restricted exhaust to provide downshift pressure on said second area means for a large downshift bias to provide manual hysteresis by manual downshift pressure for upshifts at high speed and downshifts at a lower speed.

3,886,820

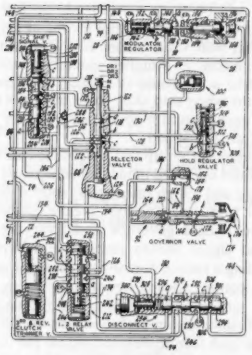
TRANSMISSION AND CONTROL

Carl A. Lentz, Mooresville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 383,767, July 30, 1973, abandoned. This application Nov. 28, 1973, Ser. No. 419,696

Int. Cl. B60k *21/02*; **F16h** *3/74*

U.S. Cl. 74—869 **3 Claims**



1. A control for a power transmission driven by a two-spool turbine engine having a compressor and compressor drive turbine on one shaft and a power turbine on the other shaft, and a fuel burner effective to heat the compressor discharge air and deliver the same to each turbine, the engine further having a rate of fuel supply control and a compressor discharge chamber wherein the pressure increases with increased compressor shaft speed and with increased air density and thereby represents turbine power comprising a plurality of selectively operable fluid operated friction drive establishing means for establishing a plurality of forward drives and a reverse drive in said transmission and one of said drive establishing means being operated in the low forward drive and the reverse drive; fluid source means for providing fluid pressure in said control; shift valve means, including manual valve means selectively moveable to forward, neutral and reverse drive positions and being in fluid communication with said fluid source means for directing fluid pressure to said fluid operated friction drive establishing means; means responsive to the compressor discharge pressure; and engagement control valve means in fluid communication with said shift valve means and said one of said friction drive establishing means for controlling the operation of said one of said friction drive establishing means including control chamber means in fluid communication with the means responsive to compressor discharge pressure for preventing engagement of said one friction drive establishing means when either (a) the manual valve means is in the forward drive position and the compressor discharge pressure is below a predetermined value or (b) the manual valve means is moved from neutral to the reverse drive position and the compressor discharge pressure is above a predetermined value.

3. A control for a power transmission driven by a two-spool turbine engine having a compressor and compressor drive turbine on one shaft and a power turbine in the other shaft, and a fuel burner effective to heat the compressor discharge air and deliver the same to each turbine, the engine further having a rate of fuel supply control and a compressor discharge chamber wherein the pressure increases with increased compressor shaft speed and with increased air density and thereby represents turbine power comprising a plurality of selectively operable fluid operated friction drive establishing means for establishing a plurality of forward drives and a reverse drive in said transmission and one of said friction drive establishing means being operated in the low forward drive and the reverse drive; fluid source means for providing fluid pressure in said control; shift valve means; including manual valve means selectively moveable to forward, neutral and reverse drive positions and being in fluid communication with said fluid source means for directing fluid pressure to said fluid operated friction drive establishing means; governor means in fluid communication with said fluid source means for establishing a governor control pressure in said control; compressor discharge pressure responsive means in fluid communication with said fluid source means for providing an engine power signal in said control; and engagement control valve means in fluid communication with said shift valve means and said one of said friction drive establishing means for controlling the operation of said one of said friction drive establishing means including a valve spool, passage means interconnecting the valve spool, said shift valve means and said one friction drive establishing means, first control chamber means in fluid communication with the engine power signal of said compressor discharge pressure responsive means and operatively connected with said valve spool for controlling movement of said valve spool to control fluid pressure in said one friction drive establishing means when the manual valve means in the forward drive position and the engine power is below a predetermined value, and second control chamber means in fluid communication with said governor means and operatively connected with said valve spool for controlling fluid pressure in said one friction drive establishing means to prevent a forward to reverse interchange in said transmission when the governor control pressure is above a predetermined value.

3,886,821

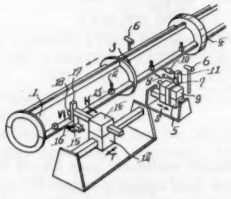
AUTOMATIC FASTENING DEVICE WITH BOLTS FOR CONCRETE MOLDS

Takeshi Tokunaga; Toshiaki Maekawa, both of Hitachi; Takeshi Uno, Tokyo; Tadashi Akagi, Shimodate; Nobuyuki Abe, Shimodate; Takeo Kume, Shimodate; Yukio Ohnishi, Shimodate, and Yasumi Shimomura, Tokyo, all of Japan, assignors to Nippon Concrete Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 19, 1974, Ser. No. 490,085

Int. Cl. B25b *13/00*, *21/00*

U.S. Cl. 81—54 **1 Claim**

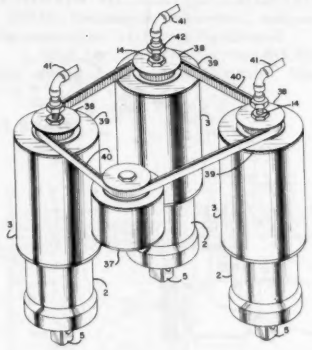


1. An automatic bolt-fastening device for molds for forming concrete piles or the like, comprising a manipulator arranged for movement relative to the mold and carrying a bolt driver unit operable to tighten or loosen the fastener bolts on the mold, detector means arranged upstream of said manipulator with respect to the movement of the mold relative thereto to detect the fastener bolts and radially projecting members of the mold with the aid of an image information taken by an industrial television camera, feeler means arranged on said manipulator for feeling engagement with the fastener bolt detected, the arrangement being such that said bolt driver unit is accurately positioned for bolt tightening or loosening operation only when a fastener bolt is detected by said detector means and is moved into a position clearing any of the radially projecting members of the mold when such member is detected.

3,886,822
POWER WRENCH WITH ROTATIVELY MOUNTED MOTOR

Reginald W. Pauley, Belle Mead, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation of Ser. No. 325,390, Jan. 22, 1973, abandoned. This application Apr. 22, 1974, Ser. No. 462,597
Int. Cl. B25b
U.S. Cl. 81—52.4 R **12 Claims**



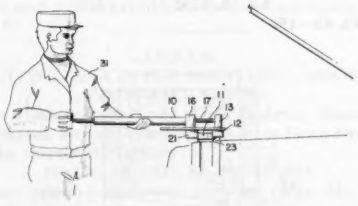
1. A power wrench comprising:

A wrench body; a rotary motor housing rotatively mounted in said wrench body; a motor rotor rotatively mounted in said motor housing for plural revolutions therein; a spindle connected to said motor rotor to be driven thereby, said spindle being adapted to be connected to a fastener for driving the fastener, means for controlling the rotation of said motor housing relative to said spindle in order for said spindle to drive a fastener, said means allowing said motor housing to rotate relative to said spindle when said spindle is stalled and applying a torque to a fastener to cause such torque to pulsate in value.

3,886,823
RADIATOR CAP REMOVER TOOL

David P. Gonzalez, and Odette A. Peacock, both of Hollywood, Calif., assignors to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Mar. 21, 1974, Ser. No. 453,270
Int. Cl. B25b *13/16*
U.S. Cl. 81—175 **2 Claims**



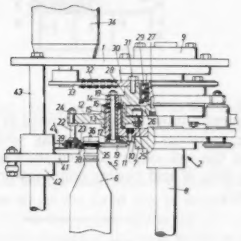
1. A tool for use in safely removing a cap of a radiator, with the user at a safe distance from the radiator cap, comprising a pair of jaws slidably mounted with respect to each other, with one of said jaws fixed at the end of a hollow tube, and the other jaw rotatably fixed to the end of a threaded rod enclosed in said tube, said rod fitted in threaded engagement with female threads formed in the interior wall of said tube, with the opposing interior faces of the jaws each formed in a concave shape, said threaded rod extending at its free end past the tube, with a handle fitted to the free rod end,

one of said jaws fixed to a plate to which the other jaw is slidably mounted, said plate located adjacent each of the jaws and oriented perpendicular to the axis of a radiator cap gripped by the jaws, so that said plate may serve as a rest for positioning the plate on the top of the radiator cap to be rotated by the tool.

3,886,824
METHOD AND APPARATUS FOR DEFLASHING HOLLOW PLASTIC ARTICLES

Edmond Michel, Brussels, and Marcel Duikers, La Hulpe, both of Belgium, assignors to Solvay & Cie, Brussels, Belgium

Filed Dec. 27, 1973, Ser. No. 428,896
Claims priority, application France, Jan. 5, 1973, 73.00441
Int. Cl. B23b *1/00, 5/14*
U.S. Cl. 82—47 **12 Claims**



1. In a process for deflashing the neck of hollow plastic articles, after they have been released from the mold in which they were fabricated and partially cooled, which process includes cutting off the neck flash of each such article gradually by a cutting component while causing the hollow article to execute a translational movement while maintaining its axis perpendicular to the cutting component, and a rotational movement about its longitudinal axis, the improvement comprising: removing each cut-off flash from the cutting component by removal means; and removing each article whose flash has not been completely cut-off from the cutting component by the same removal means.

3,886,825
METHOD FOR MECHANICALLY CUTTING FLANGES FROM PRESHAPED STEEL CONSTRUCTION MEMBERS

Ichiro Tanaka, 4-3 Kudegadanisho, Nishinomiya, Japan

Division of Ser. No. 387,251, Aug. 10, 1973, Pat. No. 3,848,499. This application July 5, 1974, Ser. No. 485,930
Int. Cl. B26d *1/00, 7/02, 5/12*
U.S. Cl. 83—13 **1 Claim**

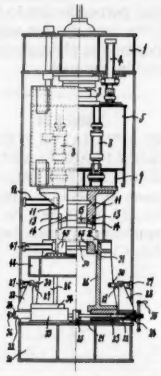
1. A method of cutting off opposite flanges from the connecting web of shaped steel articles wherein the cutting is done at the junctions between inner faces of the flanges and said web, said method comprising the steps of:

a. supporting the shaped section by its opposite flanges so that the connecting web is exposed at opposite junctions with said flanges;

b. moving a pair of generally parallel disposed cutting edges in concert transversely toward and into engagement with exposed connecting web so as to effectively shear the flanges therefrom at said junction points;

c. adjustably moving a pair of rigid parallel combined protective and supportive members respectively oppositely toward and then away from one another to first make room for initially positioning for supporting the shaped section in a predetermined position relative to the cutting edges, and for subsequently gripping the opposed inner

faces of the flanges thereby with supporting means engaging the outer faces of the flanges; and



d. subsequently moving said combined protective and supportive members yieldingly away while continuing to support the web of the shaped steel section during the cutting thru of said cutting edges toward said supportive members.

3,886,826

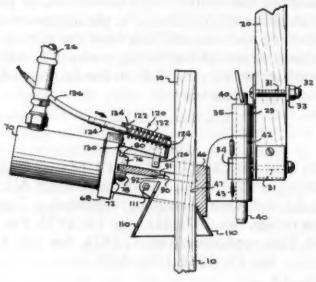
SURVEYING APPARATUS STAKE CUTTER

Robert L. Brown, 881 George Washington Hwy., Chesapeake, Va. 23323

Filed Aug. 20, 1974, Ser. No. 499,072

Int. Cl. B26d *5/12, 7/02*

U.S. Cl. 83—13 **14 Claims**



1. An apparatus for providing a vertically oriented stake having a top end termination at a desired elevation, said apparatus comprising a vertically movable support member, cutting means capable of severing a stake and selectively operable stake clamping means mounted on said support member for vertical movement adjacent a stake having a top end termination above said desired elevation for clampingly engaging said stake to prevent movement of said support member relative to said stake and indicator means on said support member indicative of the elevation of the cutting means so that actuation of said stake clamping means can be effected when the cutting means is at said desired elevation to maintain said cutting means at said desired elevation until said cutting means is actuated to provide a stake having a top end termination at said desired elevation.

3,886,827

BREAD SLICING MACHINE

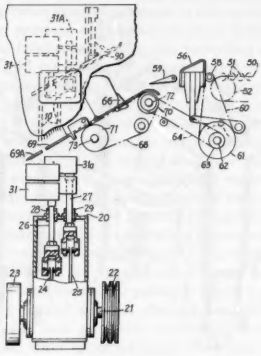
Thomas Joseph McCarthy, Richmond, Va., assignor to AMF Incorporated, White Plains, N.Y.

Filed Feb. 14, 1974, Ser. No. 442,531

Claims priority, application United Kingdom, Feb. 15, 1973, 7603/73

Int. Cl. B26d *1/46, 4/02*

U.S. Cl. 83—56 **6 Claims**



5. Method of slicing a loaf of bread including the steps of: advancing a plurality of loaves on a conveyer at an angle with respect to a plurality of slicing blades disposed in overlapping adjacent relation with respect to one another being mounted on a pair of V shaped frames; engaging the loaf with the apex of the V blade array at one corner of said loaf; urging said loaf to engage said plurality of overlapped slicing blades whereby said blades being overlapped with respect to one another by an amount equal to of from 20–80 percent of the width of such blades, enabling the action of said overlapping blade surfaces to guide the slices being cut by the reciprocating action of said blades; and guiding the completely sliced loaf away from cutting blades.

3,886,828

SHEAR

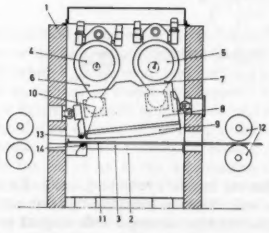
Adolf Muller, Hilchenbach-Dahlbruch, Germany, assignor to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany

Filed May 17, 1974, Ser. No. 470,747

Claims priority, application Germany, June 7, 1973, 2329095

Int. Cl. B23d *15/08, 27/00*

U.S. Cl. 83—150 **3 Claims**



1. Slitting shears for rolled sheet metal, having a bow-shaped upper knife executing a roll-cut movement and having a stationary, straight lower knife, whereby the upper knife in

relationship to the lower knife can be pre-adjusted to different sheet metal thicknesses and different penetrations,

characterized by the fact that ahead of the penetration point (10) of the upper knife (9) on the upper knife carrier (8) is position a roller (13) which extends slightly beyond the cutting edge of the upper knife (9).

3,886,829
DEVICE FOR SHEARING ROD SECTIONS IN AN AUTOMATIC MULTI-STAGE CROSS-FED PRESS

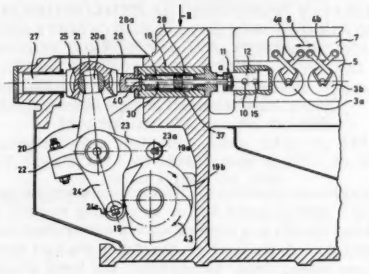
Roger Criblez, Bottmingen, Switzerland, assignor to Hatebur Umformmaschinen AG, Basel, Switzerland

Filed Apr. 29, 1974, Ser. No. 465,405

Claims priority, application Germany, May 5, 1973, 2322770

Int. Cl. B26d *3/16*

U.S. Cl. 83—198 **9 Claims**



1. A device for shearing rod sections in an automatic multi-stage cross-fed press, such a device comprising a cutter carriage for shearing rod sections from a rod feed stock, an impact carriage, said impact carriage being arranged co-axially with said cutter carriage, a reciprocable drive arrangement, said drive being rigidly coupled to the impact carriage, said drive having a drive stroke which enables the impact carriage to impinge on the cutter carriage during the final portion of a drive stroke to thereby transmit to said cutter carriage the energy necessary to perform a shearing operation, a coupling element, said coupling element interconnecting said impact carriage and said cutter carriage, said coupling element being rigidly connected to one of said carriages and being connected to the other carriage so that it is movable over a relatively small portion of the movement of that carriage and a braking device, said braking device being adapted to engage one of said cutter carriages or coupling element to arrest the relative movement between said cutter carriage and said impact carriage in both directions of the reciprocable movement.

3,886,830
CUTTING DEVICES FOR SUBDIVIDING MOVING ELONGATED STOCKS

Helmut Holthoff, Glehn, and Cyril Pazderka, Dusseldorf-Oberkassel, both of Germany, assignors to Firma Friedrich Kocks, Dusseldorf, Germany

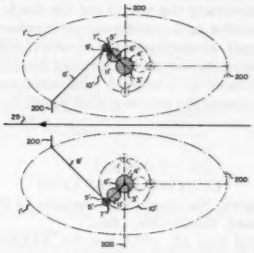
Filed May 9, 1973, Ser. No. 358,651

Claims priority, application Germany, May 24, 1972, 2225118

Int. Cl. B23d *25/06*

U.S. Cl. 83—285 **30 Claims**

1. A cutting device for subdividing moving elongated stock, especially strip- or rod-shaped or tubular rolled stock, in which each cutting tool moves in a substantially flat curve through a cutting zone during cutting and through a relatively sharp curve at each end of the cutting zone comprising a cutting tool, a carrier arm pivotally mounted at one end and free at the other, said cutting tool disposed on a free end section of said carrier arm which, when in use, describes a locus first guide means acting on said carrier arm by which it can be guided to and through the stock at a speed which at least over the length of a stock cutting path is synchronised with the speed of the stock, a linkage system of at least two levers in which the carrier arm is the last lever, all of which are effectively in the same plane, and which are pivotally connected one to another, one end of a first lever of the linkage system remote from the carrier arm being mounted for rotation about a fixed axis, a second lever in the linkage system being pivotally connected to the first lever about a common pivotal axis spaced from the fixed axis and second guide means are coupled to the second lever so that, when in use, the first lever, and with it the common pivotal axis, is rotated in a circular path about the fixed axis of rotation whilst part of the second lever in the region of the common pivotal axis also is rotated in the circular path but in addition is caused by the second guide means to pivot about the rotating common pivotal axis.



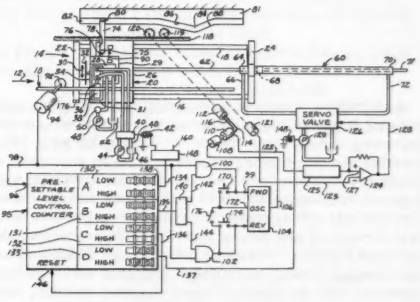
3,886,831
ELECTROHYDRAULICALLY CONTROLLED CUT OFF SAW

Anthony G. Law, East Cleveland, Ohio, and James E. Johnson, Smithfield, Mich., assignors to Chase Brass and Copper Co., Cleveland, Ohio, by said Anthony G. Law

Filed Apr. 24, 1974, Ser. No. 463,772

Int. Cl.² B26D *1/56*

U.S. Cl. 83—294 **7 Claims**



1. A cut off saw comprising

a cut off saw moveable along the path of travel of stock to be cut, and moveable transversely through the path of travel of the stock to cut the stock;

hydraulic cylinder means connected to said saw for moving said saw along the path of travel of the stock in a forward direction the same as the direction of travel of the stock, and in a reverse direction opposite to the direction of travel of the stock;

electrohydraulic control means for controlling the hydraulic cylinder means during the forward and return movement of the saw;

pulse generating means for producing a plurality of pulses each indicative of a predetermined increment of travel of the stock;

means responsive to said pulses for moving said saw along the path of travel of the stock to a predetermined position with respect to the stock and at a speed corresponding to the speed of travel of the stock;

means for traversing the saw to cut the stock;

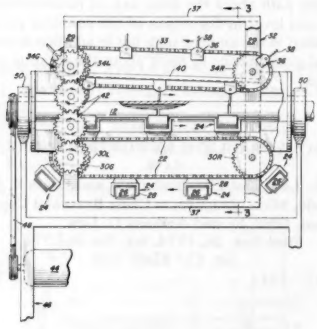
means responsive to a predetermined number of pulses to operate said electrohydraulic control means to stop movement of the saw in the forward direction; and

means responsive to a second predetermined number of pulses to return the saw to a start position.

3,886,832
CUTTING APPARATUS

Michael R. Harris, Norwood, N.J., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 15, 1973, Ser. No. 416,062
Int. Cl. B23d *25/04*; B26d *1/56*
U.S. Cl. 83—308 **3 Claims**

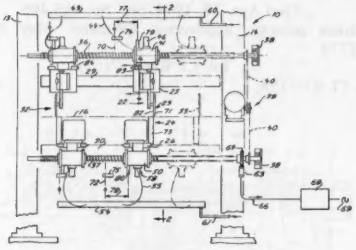


1. A cutting apparatus comprising spaced cutting means secured at predetermined intervals to a continuous conveyor traversing a fixed path, means for axially driving a tubular member in a non-rotating condition along an axial path, said continuous conveyor and said cutting means traversing a path segment intersecting the axial path of said tubular member whereby said cutting means sequentially engage outer peripheral portions of said tubular member while proceeding along said path segment, a rotatable yoke through which said tubular member passes, supportably engaging said continuous conveyor and the cutting means mounted thereon; means connected to said yoke for rotating said yoke about said tubular member; said cutting means and continuous conveyor being substantially evenly spaced from said tubular member longitudinal axis in all positions of their rotatable movement whereby said cutting means may cut said tubular member about its entire periphery; said cutting means approaching said tubular member in the direction of tubular member axial movement whereby said cutting means penetrates said tubular member to an increasingly greater depth as said cutting means proceed along said path segment and said tubular member moves axially through said yoke.

3,886,833
APPARATUS TO EFFECT REMOTE AUTOMATIC POSITIONING OF WEB SLITTER

John Wolferston Gunn, Vancouver, British Columbia, and Leonard Adolphus Murphy, North Vancouver, British Columbia, both of Canada, assignors to Elworthy and Company Ltd, Burnaby, British Columbia and MacMillan Bloedel Limited, Vancouver, British Columbia, both of, Canada

Filed May 1, 1974, Ser. No. 465,824
Int. Cl. B26d *1/24*; B23d *19/06*
U.S. Cl. 83—499 **14 Claims**



1. A positioning apparatus to effect remote automatic positioning of a slitting device for use in a slitting machine for slitting longitudinally to a required width a web of sheet material passing through the machine, the slitting machine having at least one slitting device having upper and lower complementary slitter portions, each portion mounted on a respective slitter base, the web passing between the portions; the machine further having two parallel rails extending transversely across the web, one rail being mounted on each side of the web, the positioning apparatus having transmission means co-operating with each slitter portion for moving the slitter portions along the rails, the transmission means including:

i. two rotatable feed screws extending transversely across the web and disposed parallel to the rails, each feed screw being adjacent a respective rail,

ii. a feed nut engaging one feed screw and cooperating with a respective slitter base so as to be free to rotate with the feed screw and relative to the slitter portion in a free wheeling mode, and to be locked relative to the slitter base in a feed mode,

iii. clutch means cooperating with the respective slitter base and the feed nut and adapted to be operated remotely, the clutch means permitting relative rotation between the nut and the slitter base in the free wheeling mode, and to prevent relative rotation between the nut and the slitter base in the feed mode,

iv. brake means cooperating with the respective slitter base and a respective rail and adapted to be operated remotely so as to lock the slitter base relative to the rail in the free wheeling mode;

the positioning apparatus further including:

v. reversible drive means to rotate the two feed screws so that in the feed mode a complementary pair of slitter bases are driven at equal speed in the same direction,

vi. electrical datum switch means fixed relative to and adjacent a respective rail and adjacent a datum of a particular slitting device, the switch being adapted to be actuated by a respective slitter base as the slitter base traverses the rail,

vii. a counter cooperating with one feed screw to count the revolutions of the feed screw from a particular instant so as to permit determination of position of a particular slitter base from a respective datum thereof,

viii. electronic control means cooperating with the clutch means, the brake means, the drive means, the datum switch means and the counter, the electronic control

means having an input to receive instructions relating to desired slitter position relative to the datum switch means thereof,

so that to effect remote positioning of the slitters, the feed screws are driven with the clutch engaged so as to traverse the slitter portions concurrently from an old position towards a respective datum, the clutch means being disengaged and the brake means engaged when datum switch is actuated; and when the feed screws are driven in an opposite direction with the clutch re-engaged and revolutions of the screw are counted by the counter the slitter portions are traversed along the rails and the positions thereof from the datum are determined from the number of revolutions of the feed screw, so that when the desired new location of the slitter portion is reached the clutch is disengaged, thus stopping the slitter portion, and the brake means is actuated.

3,886,834

ELECTRONIC MUSICAL INSTRUMENT CAPABLE OF MODULATION CONTROLLING A SECOND KEYBOARD SECTION TONE SIGNAL IN ACCORDANCE WITH A FIRST KEYBOARD SECTION TONE SIGNAL

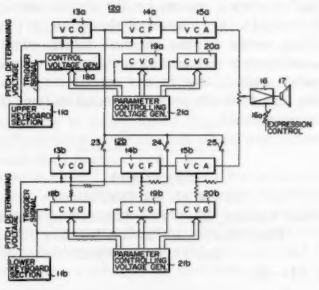
Eisaku Okamoto, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed May 8, 1974, Ser. No. 467,892

Claims priority, application Japan, May 11, 1973, 48-52367; Sept. 8, 1973, 48-105447; Sept. 8, 1973, 48-105448

Int. Cl. G10h *1/04, 5/00*

U.S. Cl. 84—1.17 **13 Claims**



1. An electronic musical instrument comprising:

a first keyboard section including a plurality of keys and means for generating a pitch determining voltage having a magnitude which is a function of the note of an operated key;

a second keyboard section including a plurality of keys and means for generating a pitch determining voltage having a magnitude which is a function of the note of an operated key;

a first musical tone signal producing means connected to said first keyboard section and including a first voltage controlled oscillator means for generating in response to the pitch determining voltage a tone signal having a frequency which is a function of the note of the operated key on said first section;

a second musical tone signal producing means connected to said second keyboard section and including a second voltage controlled oscillator means for generating in response to the pitch determining voltage a tone signal having a frequency which is a function of the note of the operated key on said second keyboard section;

sound reproducing means connected to said first and second musical tone signal producing means; and

means for coupling a tone signal from said first musical tone signal producing means to said second voltage controlled oscillator means to thereby modulate the frequency of a tone signal produced by said second oscillator means.

3,886,835

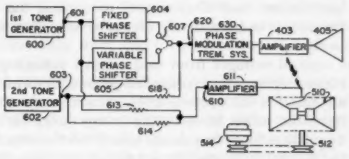
TREMULANT AND CHORUS GENERATING SYSTEM FOR ELECTRICAL MUSICAL INSTRUMENTS

Richard H. Peterson, 11748 Walnut Ridge Dr., Palos Park, Ill. 60464

Continuation of Ser. No. 44,276, June 6, 1970, abandoned, and a continuation-in-part of Ser. No. 656,925, July 28, 1967, abandoned. This application Oct. 15, 1973, Ser. No. 406,411

Int. Cl. G10h *1/02*

U.S. Cl. 84—1.24 **13 Claims**



1. A stereophonic tremulant system for an electrical musical instrument comprising:

a source of electrical signals representative of music;

a first transmission channel having an input and output and including a first loudspeaker connected to said output;

a second transmission channel having an input and an output and including a second loudspeaker connected to said output;

first modulation means connected between said input and output of said first transmission channel for continuously phase modulating signals in said first channel so that the resulting frequency modulation of said first channel signals is greater at low signal frequencies than at high signal frequencies;

second modulation means connected between said input and output of said second channel for continuously modulating signals in said second channel so that the resulting frequency modulation of said second channel signals is greater at high frequencies than at low frequencies; and

means for applying the same signals from said source of electrical signals to both said first and said second transmission channel inputs.

3,886,836

ELECTRONIC MUSICAL INSTRUMENT CAPABLE OF GENERATING TONE SIGNALS HAVING THE PITCH FREQUENCY, TONE COLOR AND VOLUME ENVELOPE VARIED WITH TIME

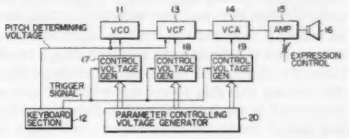
Teruo Hiyoshi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed Apr. 19, 1974, Ser. No. 462,398

Claims priority, application Japan, Apr. 11, 1973, 48-41016; Apr. 21, 1973, 48-45429; Apr. 21, 1973, 48-45430; Apr. 21, 1973, 48-45431

Int. Cl. G10h *1/02, 5/00*

U.S. Cl. 84—1.26 **13 Claims**



1. An electronic musical instrument comprising:

a keyboard section including means for generating in response to key operation a pitch determining voltage having a magnitude representing the note of any operated key and a trigger signal indicating the at least one of a depression and release operation of the key;

voltage controlled oscillator means coupled to said keyboard section for generating in response to the pitch determining voltage a tone signal having a pitch frequency corresponding to the note of the operated key;

voltage controlled filter means connected to the output of said voltage controlled oscillator means for imparting a tone color to the output signal of said oscillator means;

control voltage generating means for generating in response to the trigger signal from said keyboard section control voltages the amplitude values of which vary as a function of time, said control voltages being coupled to said oscillator means and filter means to control the oscillator frequency and frequency characteristics thereof respectively;

the control voltages from said control voltage generating means representing controlled parameters which include an initial level, normal level, attack level, attack time from the initial level to the attack level during a key depression time, first decay time from the attack level to the normal level, and second decay time from the normal level to the initial level during a key release time;

parameter controlling voltage generating means coupled to said control voltage generating means for controlling the parameters of the control voltages of said control voltage generating means; and

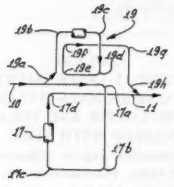
sound reproducing means connected to the output of said voltage controlled filter means.

3,886,837

MUSICAL HORN ACOUSTIC PATH MODIFICATIONS

Mark S. Veneklasen, 12338 Montana Ave., Apt. 11, Los Angeles, Calif. 90049

Filed June 18, 1973, Ser. No. 371,126
Int. Cl. G10d *7/10*
U.S. Cl. 84—388 **29 Claims**



1. In a horn having a mouthpiece and a bell, he combination comprising;

a. tubing and valving providing a direct relatively shorter acoustic path between said mouthpiece and said bell and including a loop section, and an alternate acoustic path longer than the direct path and including a crook section, both of said acoustic paths having multiple bends,

b. the valving movable to control which of said sections is connected in the acoustic path between said mouthpiece and bell,

c. the relatively shorter acoustic path including said loop section having at least as many bends as the relatively longer acoustic path including said crook section, and wherein

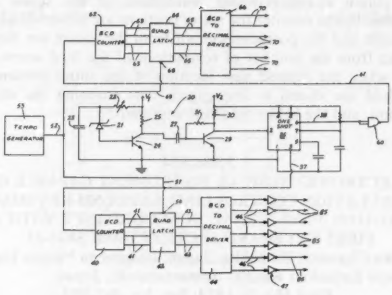
d. said valving has separate loop and crook passages for the shorter and longer acoustic paths respectively, the loop passages being substantially tortuous and the crook passages being substantially straight.

3,886,838

DEVICE FOR TEACHING MUSICAL NOTE RECOGNITION

Robert John Scherrer, 8146 Gannon St., St. Louis, Mo. 63130

Filed Feb. 21, 1974, Ser. No. 444,531
Int. Cl. G09b *15/00*
U.S. Cl. 84—470 **20 Claims**



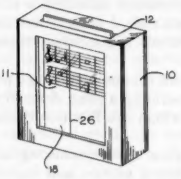
1. A device for teaching musical note recognition comprising a display screen, means on the display screen defining selected musical scales, a series of electrically activated means representing notes on the musical scales, electric circuit means, said electric circuit means including means for generating update signals and means responsive to said update signals for automatically activating random ones of said note representing means.

3,886,839

OPTICAL METRONOME

Juan M. del Castillo, Risco 119, Mexico City, Mexico

Filed Mar. 1, 1972, Ser. No. 230,701
Int. Cl. G10b *15/00*
U.S. Cl. 84—484 **2 Claims**



1. An optical metronome comprising

means to hold a sheet of music,

a pair of spaced rollers with one of said rollers mounted on each side of said holding means,

a continuous transparent web passing around and between said rollers and in front of said holding means,

at least two vertical lines drawn on said transsparent web transversely of said web,

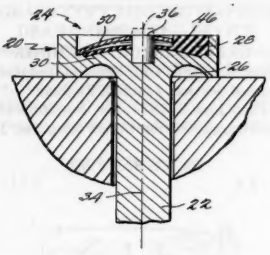
means to move said rollers to move said vertical lines past said holding means in timed relation to the music on a sheet held in said holding means, and

a casing enclosing the metronome having a slot positioned over said holding means to receive a sheet of music.

3,886,840
BOLT HEAD WHICH MEASURES AND MAINTAINS PRELOAD

Robert B. Bossler, Bloomfield, Conn., assignor to Kaman Aerospace Corporation, Bloomfield, Conn.

Continuation-in-part of Ser. No. 299,799, Oct. 24, 1972, Pat. No. 3,812,758. This application June 22, 1973, Ser. No. 372,667The portion of the term of this patent subsequent to May 28, 1991, has been disclaimed.
Int. Cl. G01l 5/00
U.S. Cl. 85—62 8 Claims

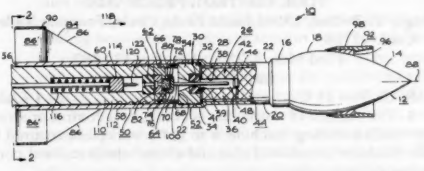


1. A bolt comprising:
a first member having a shaft portion extending along a bolt axis and terminating in a head with a first annular recess on one side of said head between a surface for bearing against a clamped member and the juncture of said shaft and said head and a second annular recess on the opposite side of said head so as to define a ring between said recesses which deflects along the bolt axis with increasing and decreasing load and having an indicator pin with a portion joined to said defined ring for movement therewith and a portion extending out of said defined ring away from said shaft portion, and
a transverse buckled column mounted in said second recess and having a central passage through which said indicator pin extends so that said column and indicator pin deflect in opposite directions with increasing and decreasing load and the relative position of said pin and said buckled column indicates the load on said bolt.

3,886,841
ROCKET POWERED ROUND

Matthew S. Smith, 4400 Sarah Apt. 29, Burbank, Calif. 91505, and Ernest A. Filippi, 18776 Kenya St., Northridge, Calif. 91324

Filed May 29, 1973, Ser. No. 364,658
Int. Cl. F41f 3/04
U.S. Cl. 89—1 F 12 Claims

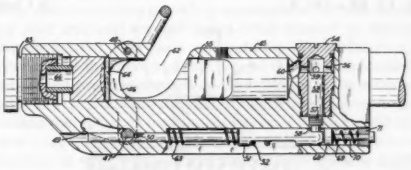


1. A rocket powered round of the type having a launch phase and a powered phase of flight and for launching from a spike launcher of the type having an elongated spike for insertion into the round for support thereof during launch, and comprising, in combination:
a war head having a forward end, an aft end and an external surface having a predetermined configuration;
a rocket motor means having:
a forward end coupled to said aft end of said war head; an aft end spaced from said forward end;
a rocket propellant grain positioned within said rocket motor means intermediate said aft end and said forward end thereof; and
a nozzle portion having a preselected nozzle area and coupled to said aft end and communicating with said rocket propellant grain;
a tail pipe having a forward end coupled to said aft end of said rocket motor means and an aft end spaced a first preselected distance from said forward end thereof, external walls, and internal walls defining a tubular passageway extending from said forward end to said aft end of said tail pipe;
a launch cartridge means detachably mounted in said tubular passageway of said tail pipe adjacent said forward end thereof and restrained therein by first predetermined force, and said launch cartridge means having:
a body member in spaced relationship to said aft end of said rocket motor means to define an initial launch volume therebetween:
a launch cartridge means in said body member for generating pressurized launch gases in said initial launch volume for the condition of ignition thereof for launching the round and initiating ignition of said rocket propellant grain, and said pressurized launch gases exerting a second predetermined force between said launch cartridge means and said rocket motor means greater than said first predetermined force to detach said launch cartridge,
whereby said elongated spike of said spike launcher is inserted into said tubular passageway of said tail pipe for abuttment against said launch cartridge means, and said launch cartridge means falls from said aft end of said tubular passageway of said tail pipe for the condition of the round launched from the spike launcher.

3,886,842
SELF-COCKING EXPLOSIVELY ACTUATED CABLE CUTTER WITH SHOCK ABSORBER

Joseph L. Giebel, Pittsburgh, and Ernest E. Temple, Murrysville, both of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Division of Ser. No. 163,949, July 19, 1971, Pat. No. 3,780,689. This application Sept. 10, 1973, Ser. No. 395,578
Int. Cl. B26d 1/00
U.S. Cl. 89—1 B 8 Claims



1. In an explosively actuated cable cutter having a frame provided with a barrel containing a cutting chisel, and means for detonating an explosive charge to drive the chisel forward, an anvil slidably mounted in the frame in front of the chisel and spaced therefrom, a crushable shock absorber in front of the anvil, and a rigid end wall in said frame in front of the shock absorber and against which the shock absorber is crushed when the anvil is moved forward by the impact of the chisel against the anvil.

3,886,843
PNEUMATIC APPARATUS FOR FIRING AN AUTOMATIC FIRING WEAPON

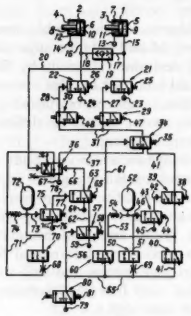
Gunter Wilhelm Hoffmann, Le Lignon, and Gilbert Magnollay, Romanel, both of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Buhrle, Zurich, Switzerland

Filed Feb. 12, 1974, Ser. No. 441,807

Claims priority, application Switzerland, Mar. 2, 1973, 3084/73

Int. Cl. F41d *11/02*

U.S. Cl. 89—136 **6 Claims**



1. A pneumatic apparatus for firing an automatic firing weapon, comprising a cylinder which can be impinged with air from a compressed air source, a first valve for controlling actuation of said cylinder, a second valve which is open in its starting position, said second valve being closed upon actuating said first valve in order to interrupt the infeed of air to said cylinder.

3,886,844
SMALL ARM

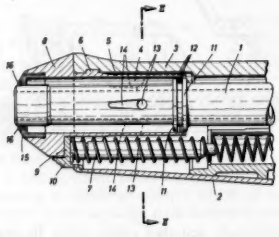
Hannes Kepplinger, and Karl Wagner, both of Steyr, Austria, assignors to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

Filed Nov. 30, 1973, Ser. No. 420,539

Claims priority, application Austria, Dec. 6, 1972, 10400/72; Oct. 24, 1973, 9021/73

Int. Cl. F41d *11/12*

U.S. Cl. 89—191 A **6 Claims**



1. A small arm, which comprises

a barrel-carrying member,

a barrel fixed in said barrel-carrying member and provided on its outside peripheral surface with a piston and formed with transverse bore means, which communicate with the inside of the barrel and open on the outside peripheral surface thereof before said piston, said outside peripheral surface being formed with recess means which extend and taper forwardly from said transverse bore means,

an action slide which comprises a cylinder, which is spaced around said barrel and defines therewith an annular chamber, which is sealed by said piston and defined by flow-obstructing means spaced from said piston beyond said transverse bore means, said action slide being capable of a recoil movement relative to said barrel so as to decrease the size of said annular chamber, and

a counterrecoil spring, which cooperates with said action slide and tends to move said action slide opposite to the direction of said recoil movement.

3,886,845
GEAR FINISHING MACHINES

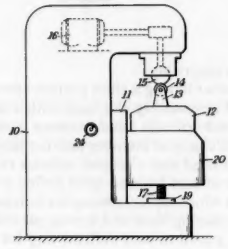
Brian Hodgson, Rowlands Gill, England, assignor to Machine Tool Divisional Services Limited, England

Filed June 8, 1973, Ser. No. 368,446

Claims priority, application United Kingdom, June 9, 1972, 27101/72

Int. Cl. B23f *19/08*

U.S. Cl. 90—1.6 **4 Claims**



1. A gear finishing machine comprising a tool gear, means for supporting a workpiece so that it may be run in mesh with the tool gear, means for imparting rotation to one of said meshing members, means for imparting radial infeed to one of said meshing members thereby generating a load on said tool gear, said infeed means including a non-rotatable nut and a screw engaging said nut and being rotatable so as to impart radial feed to said one meshing member, means for subjecting said nut to a back-up hydraulic pressure to resist said load, said screw being free from hydraulic pressure, and means for relieving the hydraulic pressure to permit said screw to move away from the other meshing member when the load on the tool gear exceeds a predetermined value.

3,886,846
METHOD FOR TESTING ACCURACY OF MACHINE TOOL CONTROL PROGRAMS

Roger E. Bodine, 17541 Santa Paula Circle, Fountain Valley, Calif. 92708

Filed Mar. 8, 1971, Ser. No. 122,192

Int. Cl. B23c *1/16*

U.S. Cl. 90—11 C **1 Claim**

1. The method of testing the accuracy of a control program by which a cutting machine is to cut a workpiece secured to the machine to selected size and shape which method comprises the steps of:

creating a block of material more easily worked than the material from which the workpiece is to be cut and which has a size greater than said selected size by casting the block of thermo setting plastic;

securing said block to the cutting machine in the position the workpiece is to occupy when secured to the machine;

causing the machine to cut said block in accordance with the control program;

causing the piece formed by cutting the block to be compared with a standard whereby errors in the shape of said piece are detected;

adding epoxy adhesive in putty form to areas of said block following cutting of the block by said machine under the control of said program;

altering the program; and

causing the block, after hardening of the putty, to be recut by said machine in accordance with the modified control program.

3,886,847
PANTOGRAPH COPY MILLING MACHINE WITH DRAWING TRACING DEVICE

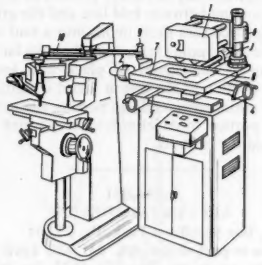
Franz Kuhlmann, Wilhelmshaven, Germany, assignor to Franz Kuhlmann KG, Prazisionsmechanik und Maschinebau, Bad Lauterberg, Harz, Germany

Filed Apr. 27, 1972, Ser. No. 247,992

Claims priority, application Germany, Apr. 30, 1971, 7116898

Int. Cl. B23c 1/16

U.S. Cl. 90—13.8 **5 Claims**



1. A machine for milling in accordance with a prepared pattern, said machine comprising:

a milling machine having a frame, a work tool and a planar work piece support table, said milling machine having means to provide a first relative motion between said work tool and said work piece support table, said first relative motion being parallel to the plane of said work piece support table, and said milling machine having means to provide a second relative motion between said work tool and said work piece support table, said second relative motion being perpendicular to the plane of said work piece support table and being controlled independently of said first relative motion; and

a tracing device comprising;

a planar pattern support table;

an electro-optical reading head disposed adjacent said pattern support table for automatically following the lines of the pattern mounted thereon;

means for providing a first relative motion between said reading head and said pattern support table in response to electrical signals generated by said reading head while automatically tracing lines on the pattern on said pattern support table, said first relative motion being parallel to the plane of said pattern support table; and means for providing second relative motion between said reading head and said pattern support table for adjustments in focusing said reading head with respect to said pattern, said second relative motion being perpendicular to the plane of said pattern support table and being independent of said first relative motion; and

a multi-link pantograph mechanism having a fixed pivot attached to the frame of said milling machine and having one link pivoted thereto and projecting therefrom, and another link pivotally connected to the moving member of said milling machine, said projecting link having its distal end pivotally attached to the moving member of said tracing device, thereby transmitting said first relative motion of said tracing device on a modified scale to said milling machine to cause similar first relative motion to occur between the work tool and the work piece support table.

3,886,848
PRESSURE OPERATED DIRECTIONAL CONTROL VALVE

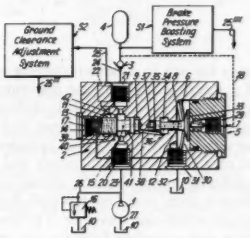
Ludwig Budecker, Frankfurt, Main, and Hubertus Von Grunberg, Niederhochstadt, both of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Apr. 3, 1974, Ser. No. 457,444

Claims priority, application Germany, May 12, 1974, 2324059

Int. Cl. F15b 11/16

U.S. Cl. 91—412 **28 Claims**



1. An apparatus including first and second utilization systems each having an inlet and requiring higher and lower predetermined pressures to operate the same, respectively, a fluid pressure accumulator having a port in communication with said first system inlet, a check valve having an inlet, and an outlet, said check valve outlet being in communication with said accumulator port and said first system inlet, said check valve being adapted to close when the accumulator pressure is above that in said check valve inlet, a pump having an inlet and an outlet, and third means connecting said pump outlet to said check valve inlet, said third means comprising: a valve body having first and second inlets, and first and second outlets, said first and second inlets being connected to said pump outlet and said check valve outlet, respectively, said first and second outlets being connected to said check valve inlet and said second system inlet, respectively; a main valve mounted in said body in a manner movable from a first position to a second position different from said first position, and vice versa, said main valve providing communication between said first inlet and said second outlet when located in said first position thereof, said main valve closing off communication between said first inlet and said second outlet when located in said second position thereof, resilient means mounted in said body in a position biasing said main valve to said second position thereof, said main valve having a surface, said main valve being movable in a predetermined direction opposite the direction in which at least a component of force is applied thereto by said resilient means, said body defining a chamber with said surface, said main valve being movable in said predetermined direction by a fluid under pressure in said chamber; conduit means forming a restriction connecting said chamber with said first inlet; a pilot valve mounted in said body and being actuable to open and to closed positions when the accumulator pressure is at lower and higher different predetermined pressure, respectively; operator means mounted in said second inlet to actuate said pilot valve, said body having a first path therethrough providing free and open communication from said chamber to one side of and through to the other side of said pilot valve, said body having a vent port, said body also having a second path therethrough providing free and open

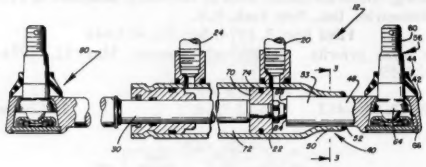
communication from said pilot valve one side to said vent port.

3,886,849

POWER STEERING SYSTEM

Maurice P. Roberts, Otterbein, and Harold K. Clendenen, Lafayette, both of Ind., assignors to TRW Inc., Lafayette, Ind.

Filed Dec. 3, 1973, Ser. No. 421,228
Int. Cl. B62d *5/10;* **G16j** *1/22*
U.S. Cl. 92—168 **5 Claims**



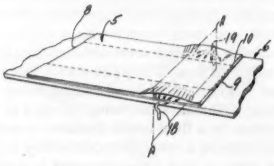
1. Apparatus for use in a power steering system to effect actuation of a steering linkage, said apparatus comprising a cylinder having a wall at least partially defining a cylindrical chamber, said cylinder having a rod end and a head end located at opposite ends thereof, said cylinder wall having a main portion of a first internal diameter and a swaged head end portion defining an opening of a second internal diameter which is different than said first internal diameter, a piston slidably disposed within said chamber, a piston rod connected with said piston and extending from the rod end of said cylinder, a ball and socket assembly connected directly to said swaged head end portion of said cylinder wall, said socket assembly including a ball, an outwardly projecting ball stud fixedly connected with said ball, a socket wall at least partially defining a recess for receiving said ball, and a socket rod integrally formed with said socket wall and extending transversely to said ball stud, said socket rod extending through said opening defined by said swaged head end portion of said cylinder wall, and means for fixedly and sealingly interconnecting said socket rod and said swaged head end portion of said cylinder wall to prevent relative movement therebetween and fluid leakage therebetween.

3,886,850

METHOD OF FORMING FLAT BOTTOMS ON BAGS OF CREASABLE MATERIAL

John B. Cole, Bratenahl, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed May 23, 1973, Ser. No. 362,888
Int. Cl. B31b *33/26*
U.S. Cl. 93—35 SB **1 Claim**



1. A method of producing a bag with a flat bottom from a bag-forming material provided as a flattened tube having symmetrically opposite longitudinally extending pleats folded laterally inwardly to a uniform predetermined depth to provide two superimposed edges at each side of the tube, said edges occurring as two laterally opposite upper edges and two laterally opposite lower edges when said flattened tube assumes a horizontal planate position, comprising the steps of:

providing in the form of a bag a section of said flattened tube continuously sealed in a straight seal line across one end of the bag, to band together all adjacent surfaces including those of said pleats, the other end of the bag being freely openable;

supporting said bag substantially in a plane on a flat surface with said lower edges next to said surface in a flat substantially deflated condition;

with reference to a fold plane in transverse perpendicular relation to the general plane of the bag located at an approximate distance from said seal line equal to twice the depth of either of said pleats, said plane having a near side and a far side in reference to said seal line, holding both lower edges at locations along said far side in juxtaposition to said plane in fixed adjacent relation to the plane of said flat surface;

gripping both upper edges along areas in juxtaposition to, and on the far side of, said plane in a manner maintaining said material between the gripped areas in taut condition, and advancing said gripped upper edges with the taut material therebetween over said held areas of the lower edges and other intermediate bag surface in close to slidable relation therewith toward said openable end to bring a longitudinally advanced portion of the bag theretofore extending between fold line and the gripped areas measuring twice said pleat depth into a taut condition;

rotating a means gripping said areas about its far side before completing its movement to place said longitudinally advanced portion of the bag in a taut condition; and

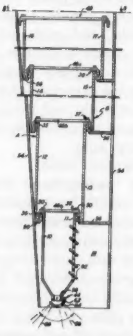
pressing the entire advanced bag portion against the underlying bag portion to develop fold lines which define and outline said flat bottom.

3,886,851

AIR CURTAIN DEVICE

Erling Berner, Box 9, Allison Park, Pa. 15101

Continuation-in-part of Ser. No. 241,925, April 7, 1972, abandoned. This application Mar. 14, 1973, Ser. No. 339,774
Int. Cl. F24f *9/00*
U.S. Cl. 98—36 **36 Claims**



1. In combination, an air screen device mountable near a wall opening comprising closure elements movable from open through intermediate to closed positions across said wall opening, means for moving said closure elements between open and closed positions in said wall opening, said closure elements comprising spaced-apart inner and outer sections enclosing a central duct-like passageway for air comprising a plenum chamber variably sized with the position of said closure elements, said plenum chamber having a fixed end dis-

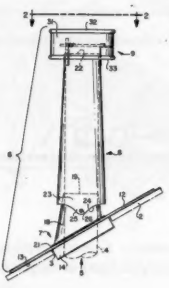
posed near an edge of said wall opening, a blower having an air outlet, said plenum communicating at its fixed end with the outlet of said blower for receiving an air screen supply of air therefrom for passage through said duct-like passageway between sections and an outlet nozzle member in an opposite movable end of said plenum to intercept and distribute air passing between said sections as an air screen across said wall opening when the closure is in open to intermediate positions in said wall opening, each spaced-apart section of said closure comprising an assembly of a series of adjacent panels separably joined together at their edges and guide means at the opposite ends of each section supported on said wall opening, securing both sections for sliding movement across said wall opening, whereby each section of said closure may slide in said guide means in parallel spaced-apart movement across said opening.

3,886,852

ROOF JACK STRUCTURE

Salvador J. Acosta, 4895 Tonino Dr., San Jose, Calif. 95123

Filed Dec. 18, 1972, Ser. No. 316,133
Int. Cl. F23l *17/02*
U.S. Cl. 98—60 **4 Claims**



1. A roof jack assembly adapted for installation on the roof of a building in association with a flue vent connector tube projecting above the roof through an aperture therein, comprising:

a. a roof flashing unit comprising a flat flash plate having an aperture therein and adapted to be superimposed over the aperture in the roof;

b. a tubular roof safe secured by one end to one surface of said flash plate in association with said aperture therein and providing an open end remote from said flash plate;

c. a roof safe extension sleeve having one end thereof pivotally mounted on said roof safe so that said open end of the roof safe projects inwardly into said roof safe extension sleeve;

d. a baffle assembly mounted on the end of said roof safe extension sleeve remote from said roof safe, said baffle assemmbly including a tubular baffle member circumscribing the upper end of said roof safe extension sleeve and supported thereby, and a flat baffle plate rotatably supported for detachability in spaced relationship to the open upper end of said roof safe extension sleeve; and

e. strap means disposed between the upper end portion of said roof safe extension sleeve and said tubular baffle member circumscribed thereabout and including a lock lug, said flat baffle plate including an aperture and being detachably secured to said strap means in a manner to permit rotation of the flat baffle plate to effect alignment of the lock lug and aperture and effect detachment thereof from the strap means for purposes of inspection after the roof jack assembly has been installed; and

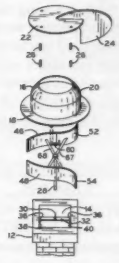
f. means for limiting penetration of said roof safe extension sleeve by said flue vent.

3,886,853

CHIMNEY DAMPER

George W. Werling, 2410 Wysstead Dr., Fort Wayne, Ind. 46819, and James Edward Voirol, 1152 Oakdale Dr., Fort Wayne, Ind. 46807

Filed Mar. 28, 1974, Ser. No. 455,528
Int. Cl. F23l *17/10*
U.S. Cl. 98—71 **7 Claims**



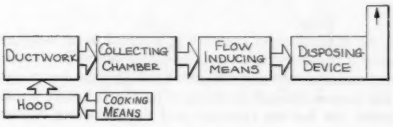
5. An improved flue damper comprising mounting means disposed within the flue opening, vane means rotatably supported on said mounting means and having relatively movable closure means whereby wind force on said vane means force said closure means together to provide a closure for said flue opening and hood means also mounted on said mounting means to provide an aperture coverable by said closure means.

3,886,854

APPARATUS FOR DISPOSING OF AIRBORNE PARTICULATE MATTER AND COOKING MEANS

Clifford Culpepper, Jr., Charlotte, N.C., assignor to Aero-Dyne Manufacturing, Inc., Charlotte, N.C.

Filed Jan. 31, 1973, Ser. No. 328,247
Int. Cl. B01d *50/00*
U.S. Cl. 98—115 K **1 Claim**



1. The combination of cooking means disposed in a food preparation area within a building for the preparation of food and from which particles of grease and the like become airborne liquid particulate matter, air flow guide means for directing air flow and including a hood positioned above said area and said cooking means and duct means extending from said hood, means for inducing air to flow from said area within the building into and through said hood and said duct means at such velocities as to entrain with the flowing air at least the major portion of airborne particulate matter originating in said area and for conveying the particulate matter in an unrestricted manner from said area, an elongate container having a generally right circular cylindrical inner wall surface and interposed between said duct means and said air flow inducing means in series flow relation with said air flow inducing means for receiving the flowing air and conveyed particulate matter, directing means operatively associated with said elongate container for directing flowing air and conveyed particulate matter entering said container generally at a right angle to the longitudinal axis of said container and tangentially to said inner wall surface and for directing flowing air and particulate matter longitudinally and circularly within said container and in a first direction generally along said longitudinal axis for

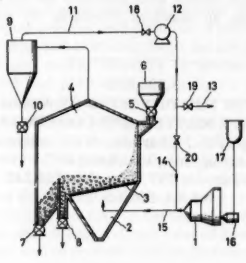
accelerating and sharply turning flowing air to leave the container generally along the longitudinal axis in a direction opposite the first direction therealong for separating most of the conveyed particulate matter from the flowing air and for retaining the separated particulate matter while passing the flowing air and the remainder of the conveyed particulate matter onward toward said air flow inducing means, and combustion means for burning the remainder of the conveyed particulate matter and located outside the building in series flow relation with said flow inducing means and said elongate container, said combustion means receiving flowing air and the remainder of the conveyed particulate matter and having a plurality of flame holder members arranged to define a plane perpendicular to the flow direction of the flowing air and at which combustion of the remainder of the conveyed particulate matter occurs while the flowing air passes to the ambient atmosphere.

3,886,855

APPARATUS FOR EFFICIENTLY ALPHIZING A LARGE MASS OF A CEREAL

Jiyuichi Nara, 14-9 Higashiooi 4-chome, Shingawa-ku, Tokyo, Japan

Division of Ser. No. 303,025, Nov. 2, 1972. This application Aug. 10, 1973, Ser. No. 387,240
Claims priority, application Japan, Jan. 17, 1972, 47-6785
Int. Cl. A23l *1/18*
U.S. Cl. 99—323.11 **7 Claims**



1. An apparatus for converting a cereal to an α-state comprising: a fluidizing column; a metering means for feeding the cereal material into said column; a hot air chamber positioned on the bottom thereof; an inclined perforated plate positioned between the hot air chamber and the fluidizing column for directing hot air at an inclination with respect to the vertical across the flow of cereals, said hot air flow also being in the general direction of cereal flow; an air heating furnace for supplying hot gas to the hot air chamber; and means for removing product from the column.

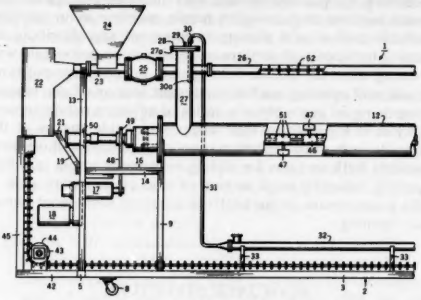
3,886,856

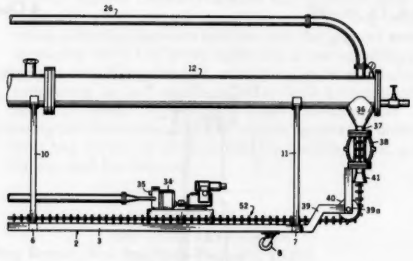
CONTINUOUS COOKER

George W. Paugh, St. Louis, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Division of Ser. No. 188,383, Oct. 12, 1971, Pat. No. 3,764,343. This application Feb. 16, 1973, Ser. No. 333,106
Int. Cl. A47j *27/00;* **A23b** *9/00*
U.S. Cl. 99—443 C **9 Claims**

1. Apparatus for continuously cooking foods under pressure comprising a frame, a driven endless conveyor on said frame, said endless conveyor having a plurality of conveying members thereon, a food inlet and outlet portion on said conveyor, a pair of restriction means about said conveyor between said inlet and outlet, cooking means connected to said frame and having an inlet and an outlet connected to said endless conveyor between said restrictor means, said cooking means including conveying means for moving the food from the inlet to the outlet thereof as the food is cooked under pressure and each restriction means including means for forming a fluid pressure seal with said conveying members as they are moved





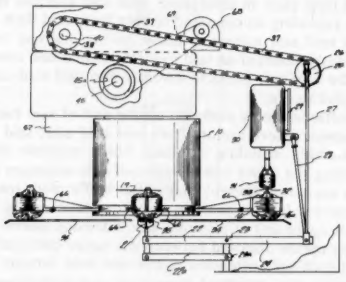
therethrough to maintain a predetermined pressure within said cooking means as the food is supplied to and discharged therefrom.

3,886,857

APPARATUS FOR CORING CAULIFLOWER HEADS

Richard J. Goodale, P.O. Box 268, Watsonville, Calif. 95076

Filed Apr. 18, 1973, Ser. No. 352,181
Int. Cl. A23n *15/02*
U.S. Cl. 99—563 **5 Claims**



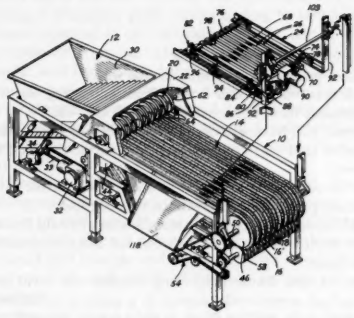
5. In apparatus for processing products having stems and cores such as cauliflower heads, the combination of a turret adapted to be rotated, a loading station, a segmenting and stemming station, a coring station and an unloading station, means connected with the turret for holding a product for progressive movement from station to station after being loaded thereon with the stem and exposed at the loading

station, said segmenting and stemming stations comprising a first knife adapted to contact and sever the stem from the product and segmenting knife adapted to be moved through the product in a direction towards and from the opposite side of the product from the first knife while the first knife is in contact with the product to hold it against movement with the segmenting knife, the coring station comprising a flat plate on which the product rests and a coring means adapted for movement into the core of the product for removal of the core, and the unloading station comprising means allowing removal of the product from the apparatus.

3,886,858
FOOD TRIMMING

Owen H. Evans; Lewis E. Lawson, both of LeSueur, Minn.; Michel L. Montaigne, and Gordon A. Muir, both of Aptos, Calif., assignors to Green Giant Company, LeSueur, Minn.

Filed Sept. 28, 1973, Ser. No. 401,950
Int. Cl. A23n *15/04*
U.S. Cl. 99—643 **35 Claims**



1. Apparatus for the trimming of projections from globular articles, comprising

guide means extending over a substantial part of said apparatus, said guide means defining a channel of substantial length for the movement of said articles therethrough and also defining a slot therein for the extension of the projections on said articles therethrough, said slot extending over substantially the entire length of said channel,

resilient means positioned on one side of said guide means opposite said slot,

means for effecting movement relative to each other of at least one of said resilient means and guide means alternately and repeatedly in directions toward and away from the other into and out of engagement with the articles when the articles are disposed in said channel,

motion imparting means for imparting forces to the articles in said channel to cause the articles to move along the length of said channel and to rotate about at least two axes of rotation perpendicular to each other, whereby the projections of the articles extend through said slot, and

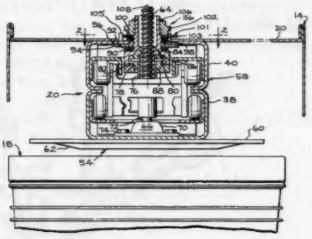
projection removing means positioned on the side of said guide means opposite said resilient means and adjacent said slot for removing said projections from said articles when the projections extend through said slot.

3,886,859
COMPACTOR BRAKE

Albert L. Hardy, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Apr. 26, 1974, Ser. No. 464,468
Int. Cl. B30b *1/18*
U.S. Cl. 100—53 **5 Claims**

1. In a household refuse compactor of the type having: frame means providing a compacting chamber including an access opening thereinto; a door mounted for movement between positions opening and closing the access opening; means for supporting an open-topped container in the chamber; a pressure plate for movement into and out of the container for compressing refuse therein; screw-type drive means supported by the frame means for vertically reciprocating the pressure plate, the screw-type drive means including screw

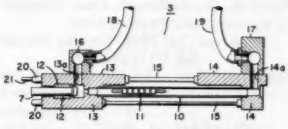


means; means mounting the plate on the screw means; and rotatable driving means for driving the screw means; the improvement comprising brake means rotatably mounted in abutting engagement with said frame means and said driving means, said brake means being adapted to rotate through an arc in response to a tightening force between said frame means and said driving means to engage stop means, thereby releasably arresting the rotary motion of said driving means.

3,886,860
MARKING PRESS DEVICE

Teruma Hayakawa, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 263,432, June 16, 1972, abandoned. This application Jan. 2, 1974, Ser. No. 430,087
Claims priority, application Japan, June 17, 1971, 46-43435
Int. Cl. B44b *5/00*
U.S. Cl. 101—4 **9 Claims**



1. An automatic marking press device comprising:

a truck movably disposed upon guide rails;

marking press means supported by said truck for marking a plate;

a driving mechanism connected to said truck for moving said truck forwardly and backwardly upon said guide rails whereby said truck and said marking press means are able to be moved relative to said plate to be marked;

auxiliary driving means for moving said marking press means longitudinally, laterally, and rotatably within a horizontal plane relative to said truck whereby the relative position between said truck and said marking press means and between said marking press means and said plate to be marked may be adjusted;

means for automatically stopping said driving mechanism of said truck; and

retractable contact rod means projecting from said marking press means toward said plate to be marked and adapted to be retracted, upon contacting said plate to be marked as said marking press means is moved toward said plate to be marked by said driving mechanism, for actuating said means for automatically stopping said driving mechanism of said truck.

3,886,861

SQUEEGEE MOUNT TO INDEPENDENTLY ADJUST SQUEEGEE ANGLE AND PRESSURE

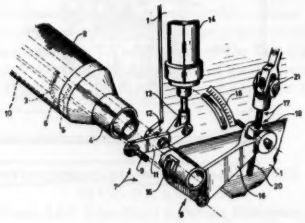
Lodewijk Anselrode, St. Anthonis, Netherlands, assignor to Stork Amsterdam N.V., Sportlaan, Amstelveen, Netherlands

Filed Feb. 29, 1972, Ser. No. 230,330

Claims priority, application Netherlands, Mar. 16, 1971, 7103481

Int. Cl. B41f 15/42

U.S. Cl. 101—119 5 Claims



1. In a screen printing machine, the combination of a frame, a squeegee supporting means comprising a tubular member positioned within a rotatable cylindrical stencil, said tubular member having both its ends protruding outwardly beyond both edges of the stencil, a squeegee secured to said supporting means and having an elongated edge for contacting the inner surface of said rotatable cylindrical stencil, and adjustable suspension means mounted on said frame connected to both ends of said squeegee supporting means and comprising at least one mounting member pivotable about an axis coextensive with said edge of the squeegee for tilting said squeegee and supporting means about said axis to vary the angle of nip between the squeegee and the screen without changing the compressive force of the squeegee.

3,886,862

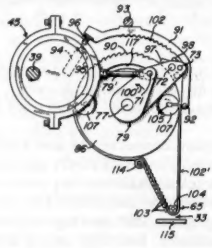
SELECTIVE PRINTING APPARATUS

Paul H. Hamisch, Jr., Bellbrook, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Nov. 24, 1970, Ser. No. 92,367

Int. Cl. B41j 7/34

U.S. Cl. 101—109 7 Claims



1. Apparatus for printing, comprising: an elongated, flexible printing band having a plurality of type elements extending in a lengthwise direction, support means about which said printing band is passed so that one type element is brought to a printing zone at any one time, a ratchet coupled to said printing band, drive means including a pawl driven along a predetermined path and cooperable with said ratchet, and means for actuating said pawl into cooperation with said ratchet at a selected point along its path so that said printing band is moved through a predetermined distance to bring the selected type element into the printing zone.

3,886,863

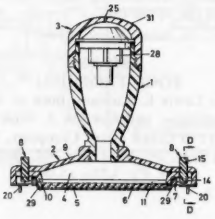
STENCIL STAMP WITH AIR VALVE AND PROTECTIVE STENCIL

Carmel John Angelo Carabott, Brenchley, and Jaffray Stuart Ross, Worthing, both of England, assignors to Stenprint Limited, Littlehampton, England

Filed Mar. 9, 1973, Ser. No. 339,499

Int. Cl. B41f 15/36; B41n 1/24

U.S. Cl. 101—125 8 Claims



1. A stencil stamp comprising

a hollow base with apertures in one wall;

an ink reservoir in said hollow base supplying ink to said apertures from the inner surface of said wall;

a porous pad having a first surface abutting the outer surface of said one wall and a second surface spaced therefrom;

a stencil releasably attached to the second surface of said porous pad by the viscosity of the ink; and

a rigid frame attached to the stencil whereby said frame and said stencil are spaced from but not directly attached to the base;

a part of said frame projecting beyond the level of said attached stencil with respect to a surface to be inked to contact said surface prior to the contact thereof by said stencil to protect said stencil from abrasion.

5. A stencil stamp in accordance with claim 4 and further comprising

at least two plungers mounted on the base operable to push against the frame to eject the frame and the stencil together from the base.

3,886,864

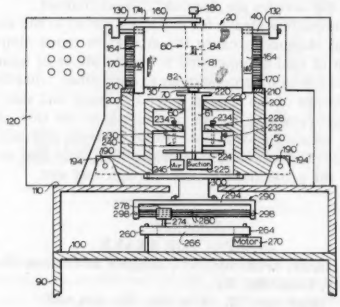
TRIANGULAR DRIVE FOR SCREEN PRINTER

Ivar F. Larsson, P.O. Box 916, Wellfleet, Mass. 02601

Filed Oct. 25, 1973, Ser. No. 409,760

Int. Cl. B41l 13/16; B41f 15/26

U.S. Cl. 101—126 5 Claims



1. Silk-screen printing apparatus comprising

a horizontally movable work-piece support table,
a work-piece support carried by said table,
first means coupled to said table by which said table can move horizontally forward and backward along a predetermined path,
a rotatable screen-carrying frame rotatably mounted on a horizontal shaft disposed transverse to said predetermined path in which said table moves,
mechanical means directly coupling together said table and said frame whereby when said table moves along said path, said frame rotates on said shaft, and including
driving means for driving said work-piece support table backward and forward in said predetermined path,
said driving means including three sprockets disposed in a common horizontal plane parallel to said table with their centers defining a triangle having a base, a first side, and a second side,
the base of said triangle being oriented transverse to said path which said table traverses, said first side being oriented at an angle to said path, and said third side being oriented generally parallel to said path,
a drive chain threaded around said sprockets and movable along a triangular path corresponding to said triangle,
a motor coupled to one of said sprockets, and
a mechanical coupling between said chain and said support table, and including a bracket slidably mounted thereon and slidable in a direction parallel to the base of said triangle and transverse to said predetermined path, said bracket exerting no force on said mechanical coupling and on said table when it moves in said direction parallel to the base of said triangle,
said bracket being secured to and moving with said chain along said triangular path, said bracket exerting a driving force on said table in one direction along said predetermined path when it moves with said chain along said first side of said triangle and in the opposite direction when it moves with said chain along said second side of said triangle.
a screen, carrying a pattern to be printed on a work-piece, secured to said frame, said screen and its pattern moving with respect to said work-piece support when said frame and said table move with respect to each other.

3,886,865

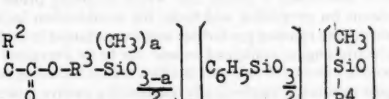
PLANOGRAPHIC PRINTING PLATES COMPRISING ORGANIC POLYSILOXANES

Michihiro Ohto, Tokyo; Atsumi Noshiro, Kanagawa; Minoru Takamizawa, and Yoshio Inoue, both of Gunma, all of Japan, assignors to Dai Nippon Printing Co., Ltd., Japan

Filed May 3, 1974, Ser. No. 466,603
Claims priority, application Japan, May 9, 1973, 48-51332
Int. Cl. G03c *1/68;* **G03f** *7/10*
U.S. Cl. 101—456 **5 Claims**

1. A planographic printing plate comprising a base plate having ink-receptive and ink-repellent areas thereon, said ink-repellent area being covered with an adhesively bonded layer of a polymerized and cured composition which comprises:

a. a photopolymerizable organopolysiloxane of the general formula



where R^1 is a hydrogen atom or an unsubstituted or halogen-substituted phenyl radical including chlorophenyl and bromophenyl; R^2 is a hydrogen atom or a methyl radical; R^3 is a divalent hydrocarbon radical having 1 to 3 carbon atoms, including methylene, ethylene and propylene; R^4 is a methyl or trifuoropropyl radical; a is 0 or 1; l, m and n are each a positive integer with the proviso that n exceeds 25 while n/l and n/m are from 25 to 2,000, and from 2.5 to 50, respectively;

b. a photosensitizer, and

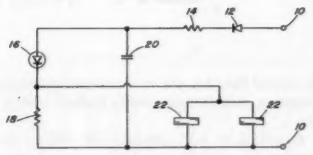
c. a solvent.

3,886,866

CAPACITOR - CONTACT FUZE SYSTEM

Ernest F. Fohrmann, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 24, 1972, Ser. No. 310,528
Int. Cl. F42c *11/00*
U.S. Cl. 102—70.2 R **10 Claims**



1. A capacitor-contact fuzing system for use in an explosive device, comprising:

a capacitor;
a detonator connected to said capacitor;
an electronic switch connected to said capacitor and said detonator for enabling the firing of said detonator when the voltage across said capacitor increases to a predetermined magnitude and
means connected to said capacitor for decreasing the capacitance thereof in response to deceleration of said explosive device whereby said decrease in capacitance increases the voltage across said capacitor.

3,886,867

CONTACT FUZE

Philip Krupen, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

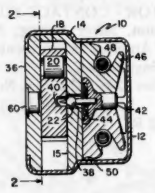
Filed Mar. 23, 1956, Ser. No. 573,574
Int. Cl.² F42C *11/00*
U.S. Cl. 102—70.2 R **5 Claims**

1. An ordnance device comprising: a first conductive element, an explosive material contained in the first conducting element, an insulating material, a forward conductive element attached by the insulating material to the first element, a detonator means for setting off the explosive material responsive to an electrical current, one side of said detonator means connected to the first element, an electrical lead connecting the other side of said detonator means to the forward conductive element, and means for electrostatically charging the two elements to approximately the same potential; so that when an aforesaid conductive element touches an object with a different electrostatic potential a current flow passing through said detonator means sets off the explosive material.

3,886,868
SPINNING BOMBLET FUZE

George Webb, Richmond, Ind., assignor to Avco Corporation, Cincinnati, Ohio

Filed Aug. 9, 1973, Ser. No. 386,933
Int. Cl. F42c 15/26
U.S. Cl. 102—79 1 Claim



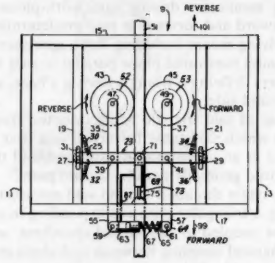
1. A spin armed fuze for use in munitions comprising:
a slider housing, said housing being formed with a channel therein;
a slider mounted in said channel for sliding movement therealong;
first locking means engaging said slider for locking said slider in the safed position, said locking means being responsive to centrifugal force to unlock said slider;
a firing pin mass;
a firing pin being secured to said mass and axially projecting therefrom and extending through said slider housing;
said slider being formed with a bore therein for receiving said firing pin in the safed position;
a detonator carried in said slider maintained in an out of line position relative to said firing pin in the safed position;
a spring mounted between said firing pin mass and said slider housing for retracting said firing pin from said slider bore before the arming spin rate is reached whereupon said slider will move along said channel to position said detonator in line with said firing pin;
a plurality of centripetally responsive weights complementally formed relative to said mass, the outer peripheral edge of said weights being rounded to permit a rocking action thereabout such that said weights can be rocked radially outwardly; and
a garter spring encircling in engaging fashion the outer periphery of said weights, said spring being in biasing contact with said weights and urging said weights inwardly into engagement with said mass so as to overcome said retracting spring and hold said firing pin in the safed position, said weights overcoming the force of said encircling spring and rocking radially outwardly in response to the centrifugal forces generated before the fuze reaches the arming spin rate, said weights rocking outwardly about said rounded edge a sufficient distance to permit said mass to be urged in an axial direction a sufficient distance to remove said firing pin from said slider bore and wherein upon impact said weights will rock inwardly thereby acting against said mass to drive said firing pin into said detonator.

3,886,869
THRUST RESPONSIVE PINCH WHEEL DRIVE MECHANISM

Keith W. Tantlinger, Coronado, Calif., assignor to Rohr Industries Inc., Chula Vista, Calif.

Filed June 5, 1974, Ser. No. 476,735
Int. Cl. B61b 13/12
U.S. Cl. 104—147 R 11 Claims

1. Pinch wheel drive mechanism for a track guided vehicle mounted on a track having oppositely facing reaction surfaces thereon, said mechanism comprising:
pinch wheel support means mounted on the vehicle for limited movement relative thereto,
a pair of pinch wheels journaled on the support means and movable toward and away from each other, said pinch wheels being in rolling engagement with such oppositely facing track reaction surfaces,
power drive means operatively connected to apply driving torque to at least one of the pinch wheels and thereby urge the pinch wheel support means in a selected direction,

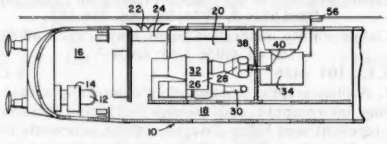


hydraulic pressure generating means operatively interposed between the vehicle and the pinch wheel support means for actuation by movement of the pinch wheel support means relative to the vehicle, and
hydraulic pressure responsive means openly communicating with the pressure generating means and operatively connected to the pinch wheels to urge the pinch wheels toward increased gripping engagement with their respective reaction surfaces upon an increase of hydraulic pressure transmitted from the pressure generating means to the pressure responsive means.

3,886,870
GAS TURBINE AND ELECTRIC DRIVE LOCOMOTIVE

Andre E. Pelabon, Paris, France, assignor to ANF Frangeco S.A., Hauts de Seine, France

Filed Apr. 13, 1973, Ser. No. 350,808
Int. Cl. B61c 7/04, 9/36, 9/38
U.S. Cl. 105—61.5 2 Claims



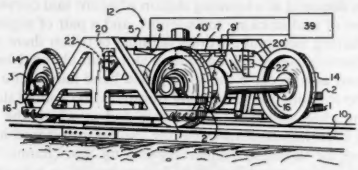
1. In a railway train of the type wherein at least one of the cars comprises a power car which includes prime mover means for propelling said train, the combination including a single free running gas turbine engine contained in said car, an electric engine contained in said car to be energized from a source exterior to said car, gearbox means including reversing gear means for mechanically transmitting motive power to the wheels of at least one of the bogies of said power car, and coupler means for selectively coupling said gas turbine engine and said electric engine to said gearbox means to transmit power selectively from only one prime mover means during any particular operational period, whereby each of said engines may selectively directly supply power to the same bogie wheels for propelling said train through the coupler means in either direction.

3,886,871

RAILWAY TRUCK MAGNETIC SUSPENSION

James A. Ross, and Bert C. Harris, both of La Jolla, Calif., assignors to Rohr Industries Inc., Chula Vista, Calif.

Filed May 8, 1972, Ser. No. 251,118
Int. Cl. B61f 5/04; F16c 39/06; F16f 6/00
U.S. Cl. 105—157 R 15 Claims



1. An improved attractive magnetic suspension and vertical damping apparatus for providing an air gap spaced apart support between the bolster and side frame assembly and surface supported portions of the truck of a high speed vehicle comprising:

elongated ferromagnetic side frames carried by said surface supported portion;

elongated electromagnets having windings and carried by said bolster and side frame assembly portion, each of said electromagnets positioned below one of said ferromagneitc side frames in opposing spaced relation therewith for magnetic attraction therebetween; and

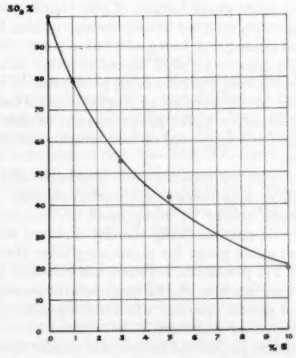
active control means for constantly varying the strength of the force fields of said electromagnets responsive to the length of said gap and to the vertical movement of the bolster and side frame assembly portion for maintaining a predetermined spaced gap relationship and damping control between said bolster and side frame assemblies and surface supported portions.

3,886,872

METHOD AND COMPOSITION FOR REMOVAL OF SOOT AND DEPOSITS FROM HEAT EXCHANGE SURFACES OF COMBUSTION UNITS

Walter Tony Mallen, Orebro, Sweden, assignor to Nitro Nobel AB, Gyttorp, Sweden

Filed Mar. 20, 1973, Ser. No. 342,931
Claims priority, application United Kingdom, Mar. 25, 1972, 14105/72
Int. Cl. C10l 9/02
U.S. Cl. 110—1 J 5 Claims



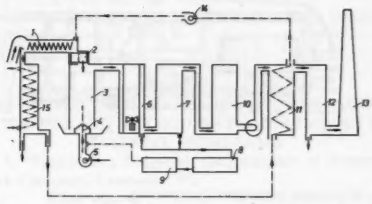
1. A method for the removal of soot and deposits from heat exchange surfaces of a combustion unit comprising charging to said combustion unit while operating a mixture of more than fifty percent of a nitrate and a minor percent of borax, said mixture being capable of forming a catalytically inactive compound with iron and vanadium oxides under combustion conditions, and continuing the operation of said combustion unit at its normal operating temperature for a sufficient period of time to cause the deposits to crack and/or loosen from the said surfaces.

3,886,873

METHOD IN THE DESTRUCTION OF WASTE BY GASIFICATION AND COMBUSTION

Hans Edvin Sundqvist, and Karl Erik Gustav Andersson, both of Motala, Sweden, assignors to AB Motala Verkstad, Motala, Sweden

Filed June 5, 1973, Ser. No. 367,096
Claims priority, application Sweden, June 15, 1972, 7913/72; Dec. 15, 1972, 16450/72
Int. Cl. F23b 7/00
U.S. Cl. 110—8 R 4 Claims



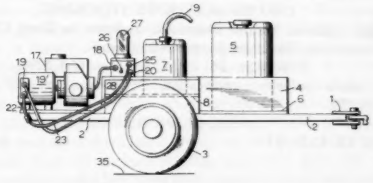
1. In a method for the destruction of waste by generating gas from the waste in a gas generator and delivering the gas to a combustion chamber for combustion thereof, the improvement comprising separating water-soluble hydrocarbons from the generated gas and continuously recycling said water-soluble hydrocarbons by returning said hydrocarbons to the gas generator prior to the combustion of the generated gas.

3,886,874

SUB-SURFACE ROOT FERTILIZER AND PROBE

Edward A. Platz, Opossum Rd., Bellemead, N.J. 08502

Division of Ser. No. 245,959, April 21, 1972, Pat. No. 3,783,804. This application Aug. 3, 1973, Ser. No. 385,326
Int. Cl. A01c 23/02
U.S. Cl. 111—7.4 14 Claims



1. Apparatus for sub-surface root fertilization, comprising:

a frame;

a platform mounted on said frame for holding a plurality of tanks, at least one tank mounted on said platform;

pumping means attached to said frame, said pumping means including control means associated therewith, the input of said pumping means communicating with one of said tanks;

a generally cylindrical probe having a flow passage for fluid flow within said probe, said probe having a mounting chuck at one end and a conical tip at the other end, the output of said pumping means communicating with said fluid passage within said probe, said fluid passage including at least one aperture through the walls of said probe near said conical end, said control means including timing

means adjustable throughout the range of 0.2 second to 60 seconds, said timing means determining the amount of fluid pumped out through said probe by controlling the duration of operation of said pumping means;

and an impact hammer means non-rotatably attached to said chuck end of said probe for driving said probe beneath the surface of the ground.

3,886,875

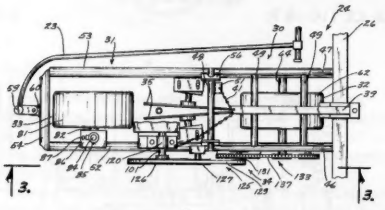
PLANTER APPARATUS

Arnold E. Ernst, Wolverton, Minn. 56594

Filed Nov. 21, 1973, Ser. No. 417,741

Int. Cl. A01c *5/00*

U.S. Cl. 111—85 **8 Claims**



1. A planter apparatus comprising;

a tool bar adapted to be attached to the A-frame of a conventional tractor;

a U-frame pivotally connected at one end to said tool bar;

an H-frame rockably secured substantially centrally intermediate its ends to said U-frame, whereby said H-frame is rockable relative to said U-frame;

a pair of ground engaging wheels rotatably mounted to the front and rear of said H-frame drive means on said H-frame;

a pair of discs rotatably mounted on said H-frames intermediate said wheels and mounted thereon for making an incision in the ground; and

means mounted on said H-frame and operatively connected to said drive means operative during movement of said tool bar for discharging seed into said incision.

3,886,876

APPARATUS FOR THE CLOSING OF THE TOE OF A CIRCULARLY KNIT STOCKING

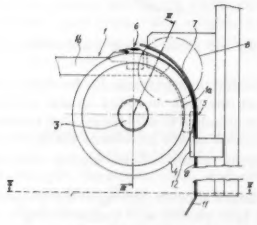
Viggo Sparso, Virum, Denmark, assignor to Hans Christian Andersen, Kastanienbaum, Switzerland

Filed Apr. 25, 1974, Ser. No. 464,229

Claims priority, application Denmark, Apr. 27, 1973, 2310/73

Int. Cl. D05b *7/00*

U.S. Cl. 112—27 **4 Claims**



1. An apparatus for the closing of the toe of a circularly knit stocking which is knit from yarn forming a stocking web with a thickened bead along the edge of an opening to be closed by means of the apparatus, said apparatus comprising a stationary flat stocking toe support having a curved edge portion, a presser foot engageable with said stocking toe support to clamp the toe portion of a stocking between said presser foot and said support, said presser foot being rotatable about a central axis thereof and having a clamping edge substantially concentric with said curved edge portion of said stocking toe support and spaced at a small distance therefrom, toe closing means disposed at a seaming station adjacent said curved edge portion of said stocking toe support, and a pair of superposed jaws having marginal portions defining between them a guiding channel having a longitudinal slot, said channel being so disposed as to receive the superposed bead halves of a stocking, the stocking web extending through said channel slot, said guiding channel having a first free end at which the superposed bead halves of the stocking can be introduced into the channel for sliding movement therealong, said channel having a first portion extending to a delivery position adjacent the curved edge of said support for introducing the stocking web, extending through the channel slot, between said support and said presser foot, said channel having a

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3,886,877

UNIVERSAL LOCKSEAMER MECHANISM

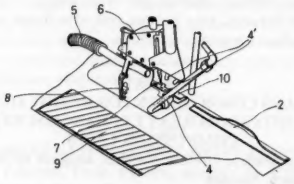
Hachiro Akaishi; Shigeo Busuzima, both of Kiriu; Morio Katayama, Ashikaga, and Akinori Kan, Kiriu, all of Japan, assignors to Kabushiki Kaisha Gunpo, Japan

Filed Dec. 27, 1973, Ser. No. 428,733

Claims priority, application Japan, Dec. 29, 1972, 48-770

Int. Cl.[2] D05b *21/00, 35/02*

U.S. Cl. 112—121.15 **1 Claim**



1. An improved lockseamer mechanism for use with a three thread type of sewing machine having a body and a needle, comprising:

a principal guide gauge formed of thin stainless steel sheet and removably coupled to said sewing machine body, said principal guide gauge being adapted to guide cloth having a straight edge or an edge curved in either direction;

a table, said sewing machine being positioned on said table, said table having permanent magnets buried therewithin; a supplementary guide gauge formed of thin stainless steel sheet and supported on said table by said permanent magnets;

a plurality of air jet nozzles mounted adjacent said principal guide gauge and operatively directed thereto;

an adjustable source of compressed air coupled to said nozzles, air streams being thereby directed toward said principal guide gauge for positioning cloth therewithin;

an electric eye positioned between said principal gauge and said sewing machine needle and operatively coupled such that said needle operates when said electric eye detects the presence of said cloth;

vacuum means positioned behind said needle for attracting said cloth thereto; and

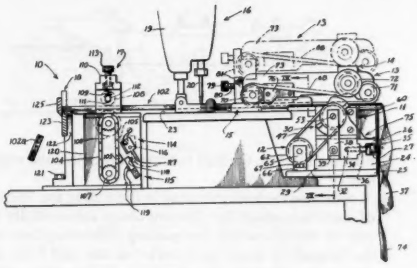
a band roller positioned adjacent said principal guide gauge for advancing cloth having relatively large dimensions, whereby cloth can be automatically fed to the sewing machine once it is placed in the gauge.

3,886,878

AUTOMATIC FABRIC HANDLING APPARATUS

Charles Block, North Bellmore, N.Y., assignor to Joseph Galkin Corporation, Hicksville, N.Y.

Filed Mar. 29, 1973, Ser. No. 346,070
Int. Cl. D05b 37/08
U.S. Cl. 112—121.27 28 Claims



1. Fabric trimming apparatus for use with sewing machines, or the like, comprising, in combination: first and second support blocks movably supported upon a base platform, said support blocks disposed in spaced relationship with respect to one another and being formed with upwardly extending and second projections, respectively; first and second stationary cutting blades removably secured to said first and second projections, respectively; first and second rotary cutting blades supported by first and second journalled shafts and cooperatively engaging said first and second stationary cutting blades, respectively; first and second sprocket means carried by said first and second shafts for independently driving said first and second rotary cutting blades; first and second adjustment means for independently controlling contact pressure between said first and second pairs of rotary and stationary cutting blades, respectively; and positioning means for selectively varying the distance between said first and second support blocks, thereby varying the width of fabric to be trimmed thereby.

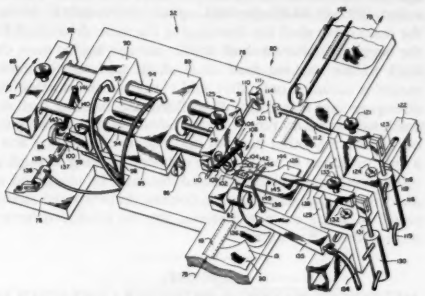
3,886,879

SHIRT FRONT ASSEMBLY, METHOD AND APPARATUS

Wade W. Frost, Vidalia, Ga., and William C. Sandlin, Waco, Tex., assignors to Oxford Industries, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 391,645, Aug. 27, 1973, which is a division of Ser. No. 243,753, April 13, 1972, Pat. No. 3,780,682, which is a continuation-in-part of Ser. No. 79,031, Oct. 8, 1970, Pat. No. 3,675,604. This application May 6, 1974, Ser. No. 467,052
Int. Cl. D05b 37/04
U.S. Cl. 112—130 12 Claims

1. A fabric cutter for cutting apart a series of shirt front assemblies connected together by a continuous connected series of center plait pattern parts comprising means for conveying the shirt front assemblies along a predetermined path, sensing means for detecting the presence of the leading and trailing portions of each of the shirt front assemblies of the connected series of shirt front assemblies and temporarily stopping the conveying of the connected series of shirt front assemblies as the leading and trailing portions of the shirt front assemblies move past a cutting station, cutting means at said cutting station for cutting away the leading and trailing ends of the center plait pattern parts of each of the shirt front



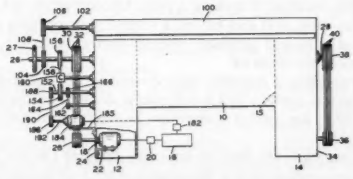
assemblies while the conveying of the shirt front assemblies has stopped.

3,886,880

TUFTING MACHINE NEEDLE DRIVE DISENGAGING MECHANISM AND METHOD OF PRODUCING TUFTED MATERIAL USING SAME

John A. Watson, Sr., Lafayette, Ga., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed May 4, 1973, Ser. No. 357,109
Int. Cl. D05c 15/10
U.S. Cl. 112—266 7 Claims



1. In a tufting machine for producing cut pile material by tufting yarn through a backing to form loops and cutting said loops, said tufting machine having an electric motor, a main drive shaft connected to said motor, a needle drive rocker shaft driven by said main drive shaft through a needle drive cam and connecting rod and a needle drive disengaging means, said needle drive rocker shaft in turn driving a tufting needle, a looper drive shaft driven by said main drive shaft, said looper drive shaft moving a looper, a knife drive shaft driven by said main drive shaft, said knife drive shaft moving a knife, backing feed drive shaft driven by said main drive shaft, said backing feed drive shaft moving a backing feed roll, and the yarn feed drive shaft driven by said main drive shaft, said yarn feed drive shaft moving said yarn feed roll, the improvement comprises an auxiliary power means, said needle drive disengaging means for disengaging said needle drive rocker shaft from said main drive shaft and thereby stopping the movement of said tufting needle for use in combination with said auxiliary power means connected to said backing feed drive shaft to drive said backing feed roll and advance the backing through the tufting machine when said backing feed drive shaft is not driven by said main drive shaft, said needle drive disengaging means having two operative positions, one being the position wherein said needle drive disengaging means couples said main drive shaft to said needle drive rocker shaft which causes the needle to reciprocate and tuft yarn through said backing as the machine is operating and the other being the position wherein said needle drive disengaging means disengages said main drive shaft from said needle drive rocker shaft thereby stopping the needle reciprocation which

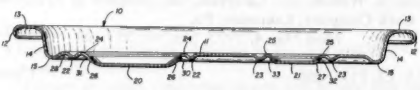
stops the tufting of yarn through said backing even though all other parts of the machine are operating, a means for moving said needle drive disengaging means into either of said two operative positions at any one instance in time, and a clutch means through which the backing feed drive shaft is driven by the main drive shaft for disengaging the main drive shaft from the backing feed drive shaft and for reengaging the main drive shaft to the backing feed drive shaft, said auxiliary power means is actuated only after said clutch means is actuated to disengage said main drive shaft from said backing feed drive shaft, said auxiliary power means advances said backing without having any other parts of said machine operating and for a time sufficient to advance the untufted backing through said tufting machine a predetermined distance, by using said needle drive disengaging means in conjunction with said auxiliary power means a cut pile material may be produced having a portion thereof untufted.

3,886,881

METHOD OF MAKING A PRESS TAB CONTAINER END FROM A METALLIC SHELL

Ronald A. Pearce, Lakewood, and Thomas R. Herrmann, Wheat Ridge, both of Colo., assignors to Coors Container Company, Golden, Colo.

Filed Dec. 3, 1973, Ser. No. 420,773
Int. Cl.[2] B21D *51/26*
U.S. Cl. 113—121 C **3 Claims**



1. The method of making a press tab container end from a metallic shell, said end having a hinged pour opening closure tab and a hinged pressure release vent closure tab, which comprises the steps of

a. providing a metallic shell consisting of a generally flat central portion and a peripheral drawn and curled area which has gasket compound in said drawn and curled area,

b. forming in the shell an upwardly opening circular groove surrounding each of the proposed areas of a pour opening closure tab and a pressure release vent closure tab, and forming a rib located radially inwardly of each of said grooves,

c. lancing the metal slightly radially inwardly of the top of said ribs to cut the tab areas and small circumferential parts of said ribs from the shell excepting where the tabs are joined hingedly to the shell,

d. reforming the shell to flatten and enlarge the tab areas,

e. coining the reformed shell to make the tab edges underlie surrounding shell areas, and

f. applying a sealant to the shell to cover the seam between the overlapping tabs and surrounding shell surfaces to provide an air and fluid tight seal.

3,886,882

MOORING APPARATUS FOR ICE-BREAKING DRILL SHIP

Russell B. Thornburg, Palos Verdes Peninsula, and Klemme M. Jones, Escondido, both of Calif., assignors to Global Marine Inc., Los Angeles, Calif.

Filed Apr. 23, 1973, Ser. No. 353,690
Int. Cl. B63b *35/10, 35/44, 21/14*
U.S. Cl. 114—40 **4 Claims**

1. An ice-breaking drill ship for operation in ice-covered waters, including operation while moored over a fixed submerged location in the presence of ice movable laterally relative to the submerged location, comprising, in combination,

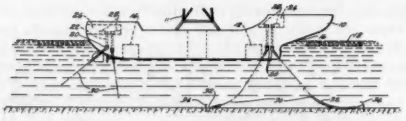
a. a ship-form hull,

b. means in the hull operable for inducing pitching motions of the hull effective at the bow, including during periods when the hull is moored, for breaking any surrounding ice below the bow, and

c. means for mooring the hull to a plurality of submerged anchor points disposed about a desired fixed submerged location and for adjusting the heading of the hull while so moored into the direction of movement of ice over the submerged location including

i. a plurality of winches mounted to the hull adjacent the bow and stern thereof,

ii. hawseholes in the hull in association with the winches for passage of mooring lines therethrough from the winches to the exterior of the hull, the hawseholes



opening through the hull substantially below the waterline of the hull, and

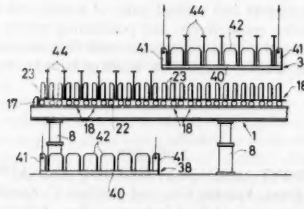
iii. a rotatable fairlead mounted in the hull at the opening of each hawsehole for rotation about substantially the axis of the hawsehole for guiding a mooring line into the hawsehole from the exterior of the hull from any direction, whereby the heading of the ship, while moored and during operation of the pitch inducing means, may be changed by controlled selective operation of the winches to take in and pay out mooring lines extending from the winches via the hawseholes to submerged anchor points disposed about the desired fixed location.

3,886,883

APPARATUS FOR DISPOSING LONGITUDINALS FOR CONSTRUCTING HULL BLOCKS

Minoru Odaka, Ichiharashi, Japan, assignor to Mitsui Shipbuilding and Engineering Co. Ltd., Tokyo, Japan

Filed Apr. 9, 1974, Ser. No. 459,286
Claims priority, application Japan, Apr. 10, 1973, 48-40535
Int. Cl. B63b *3/18*
U.S. Cl. 114—65 R **1 Claim**



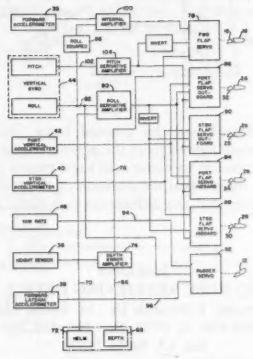
1. An apparatus for disposing longitudinals for constructing hull blocks comprising supports each of which having guide rails on the top thereof, traveling pallets provided on said supports, each pallet having a pair of holding plates for holding a longitudinal and being connected to adjacent pallets by flexible connecting means for keeping a predetermined distance between pallets, driving means for moving said pallets, a crane, transporting pallets suspended from said crane for transporting longitudinals to said traveling pallets and for transferring them onto the traveling pallets, each transporting pallet having a plurality of holding plates for holding longitudinals arranged in a manner such that longitudinals held by the holding plates can be received by said traveling pallets while said pallets are closely arranged on said supports, parallel jigs mounted to said supports for receiving and holding longitudinals after said traveling pallets have been moved to a spaced-

apart position, and means for assembling said longitudinals to transverses, and means for lifting and lowering either the said supports or the jigs to effect a transfer thereto.

3,886,884
CONTROL SYSTEM FOR HYDROFOIL

Donald R. Stark, Seattle, and Irving A. Hirsch, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Oct. 31, 1972, Ser. No. 302,559
Int. Cl. B63b *1/28*
U.S. Cl. 114—66.5 H **17 Claims**



1. In a control system for a hydrofoil craft having forward and aft foils, the combination of separate port and starboard flap means on at least one of said foils, rudder means associated with said foils, means for generating a command signal for turning said craft, means responsive to said command signal for initially actuating said separate flap means to cause said craft to bank about its roll axis in the direction of a desired turn, means for sensing banking of the craft about its roll axis in response to actuation of the separate flap means, and apparatus coupled to said sensing means for thereafter actuating the rudder means to turn the craft in said direction of desired turn.

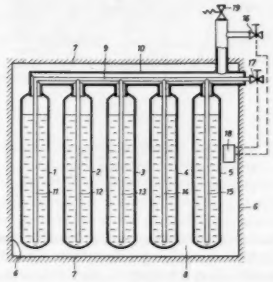
11. In a control system for a hydrofoil craft having forward and aft foils, the combination of control flap means on the forward foil, flap means on the aft foil, means for sensing the height of said craft above the surface of the water when it is foil-borne and for producing an electrical signal proportional to said height, means for producing an electrical signal proportional to desired height of said craft above the water, means for comparing said first and second electrical signals to derive an error signal when the first and second signals are not the same, and means responsive to said error signal for controlling the position of only the control flap means on the forward foil to cause the hydrofoil craft to rise or descend until said error signal is zero.

15. In a control system for a hydrofoil craft having forward and aft foils, the combination of flap means on the forward foil, separate pairs of port and starboard flaps on the aft foil, a first pair of hydraulic actuators for actuating one port and one starboard flap of each pair, a second pair of hydraulic actuators for actuating the other flap of each pair of port and starboard flaps, a single hydraulic actuator for the forward flap means, a first source of fluid under pressure for actuating the first pair of hydraulic actuators, a second source of fluid under pressure for actuating the second pair of hydraulic actuators, and shuttle valve means for connecting said single actuator for the forward flap means to either the first or second source of fluid under pressure.

3,886,885
CONTAINER SYSTEM FOR THE STORAGE AND/OR TRANSPORTATION OF LIQUEFIED GAS

Rudolf Becker, and Wolfgang Becker, both of Munich, Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Apr. 26, 1973, Ser. No. 354,887
Claims priority, application Germany, July 31, 1972, 2237699
Int. Cl. B63b *25/12*
U.S. Cl. 114—74 A **1 Claim**



1. A system for the storage and/or transport of a low-temperature liquefied gas, said system comprising:

a plurality of thermally insulated walls defining an open-space storage chamber;

a plurality of generally upright vertically elongated liquefied-gas storage receptacles disposed in said chamber in spaced relationship in a row, each of said receptacles having a bottom portion adapted to receive a liquefied gas and an upper portion forming a vapor space above the liquefied gas in said receptacle;

a first conduit network communicating with said vapor spaces of all of said receptacles of said row within said chamber, said first conduit network comprising:

a horizontal large-cross-section dust spaced directly above said receptacles and extending along said row over all of the receptacles thereof;

a respective large diameter pipe fixed centrally to each of said receptacles and extending vertically therefrom to terminate at said duct while communicating between the respective vapor space and said duct, and

a vertical riser extending upwardly from said duct through one of said walls, said duct having an end extending into another of said walls;

a second conduit network communicating with said bottom portions of said receptacles and entirely received in said receptacles and said first network within said chamber, said second network including a first-horizontal tube of relatively small cross-section extending through said duct and emerging therefrom at said one end outside said chamber, and respective small-cross-section second tubes extending vertically from said first tube through said pipes and reaching downwardly into said receptacles substantially to the bottoms thereof;

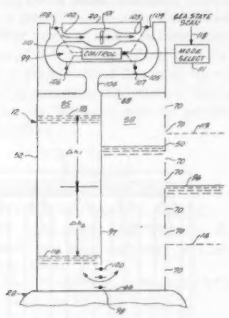
a pressure relief valve communicating with said riser for venting said first network; and

respective controllable valves connected to said first network and to the end of said first tube emerging from said duct and selectively operable for charging said receptacles with liquefied gas and discharging liquefied gas from said receptacles.

3,886,886
PASSIVE SHIP MOTION STABILIZATION SYSTEM WITH ACTIVE ASSIST FOR HIGH AMPLITUDE MOTIONS

Edward Olen Anders, Houston, Tex., assignor to Global Marine Inc., Los Angeles, Calif.

Filed Feb. 28, 1974, Ser. No. 446,700
Int. Cl. B63b *43/06*
U.S. Cl. 114—125 **8 Claims**



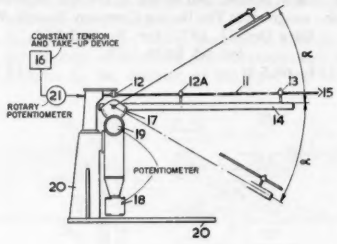
1. A motion stabilization system for a floating vessel having a buoyant hull comprising a first tank extending vertically in the hull from a first selected location below the load waterline to a second selected location above the waterline and having at least one vertical boundary thereof defined by the hull shell, a plurality of vertically spaced openings from the tank through the shell, some of the openings being located below the waterline and some of the openings being located above the waterline, a second tank extending vertically in the hull from about the elevation of the first location to about the elevation of the second location, means providing water flow communication between the lower ends of the tanks and having an effective water flow rate therethrough greater than the effective water flow rate through said openings, and air flow means communicating with the upper extent of the second tank operable alternately to generate superatmospheric air pressure in the second tank and to generate subatmospheric air pressure in the second tank.

3,886,887
SYSTEM FOR CONTROLLING THE POSITION OF A FLOATING VESSEL

Sinclair Upton Cunningham, and Douglas Jackson, both of East Kilbride, Scotland, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Feb. 5, 1973, Ser. No. 329,401
Claims priority, application United Kingdom, Feb. 4, 1972, 5249/72
Int. Cl. B63b *21/00*
U.S. Cl. 114—230 **5 Claims**

1. A system for controlling the position of a moored floating vessel comprising a reference datum fixed relative to the moorings of said vessel, propulsion means capable of moving the vessel, logic means controlling the propulsion means, and position detecting apparatus for providing output signals related to any difference(s) between the actual position and heading of the vessel and the required position and heading in relation to said reference datum, the position detecting apparatus including a base fixable to the vessel, on said base a head pivoted so as to be able to turn in two planes mutually at right angles, a first means for producing output signals related in sign and magnitude to any change in angle of the pivoted head from a predetermined angle in either said plane, a cord having a first end so located that the cord can be guided so as to pass through said pivoted head and having a second end adapted to be fixed to said reference datum means for maintaining said cord in tension whereby the pivoted head can turn in response to any change in angular direction of the cord therethrough, a second means for producing an ouptut signal related to the length of any portion of the cord lying at any time between the

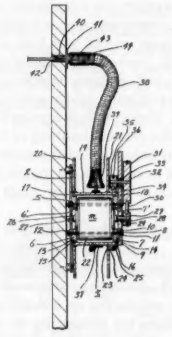


second end thereof and the pivoted head, and means for feeding said output signals from the position detecting apparatus to the logic means to cause said logic means to so control the propulsion means that the position of the vessel is altered in such a manner that the difference(s) is reduced in magnitude.

3,886,888
SKI ROPE RETRIEVING DEVICE

Charles O. Parsons, 1 Decorah Dr., St. Louis, Mo. 63141

Filed Oct. 1, 1973, Ser. No. 402,269
Int. Cl. B63p *21/00*
U.S. Cl. 114—235 WS **11 Claims**



1. A ski rope retrieving device comprising a support, first and second spaced-apart end plates planarwise parallel to said support, a prime mover disposed between said first and second end plates, said first end plate being proximate said support, said second end plate being remote from said support, means mounting said first and second end plates and said prime mover upon said support, said end plates having parallel portions projecting beyond said prime mover, bearing means provided upon said end plate projecting portions, a ski rope storage member having a cylindrical body portion supported for rotation about its longitudinal axis on said bearing means and being enclosingly disposed about said prime mover and cooperating with said end plates to define a housing for said prime mover, first and second side flanges mounted upon, and projecting radially outwardly of, said cylindrical body portion of said storage member being rotatable therewith and cooperating with the outer surface of said cylndrical portion to define a storage zone for a ski rope, said first side flange being proximate said support, said second side flange being remote from

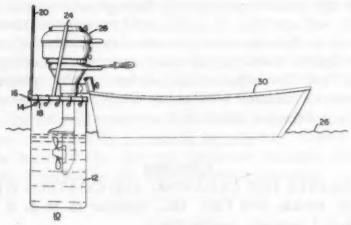
said support, a drive shaft provided on said prime mover, said second end plate having an opening through which said drive shaft extends laterally beyond said second end plate and said second flange, and motion transmission means interconnecting said drive shaft and said cylindrical portion of said storage member laterally beyond said second flange for effecting rotation of the said cylindrical portion of said storage member upon operation of said prime mover.

3,886,889

PORTABLE CLEANING DEVICE FOR OUTBOARD MOTORS

Anthony John Burger, 5225 Oberlin Ave., Lorain, Ohio 44053

Filed June 7, 1973, Ser. No. 368,040
Int. Cl. B63b *59/00*
U.S. Cl. 115—.5 R **1 Claim**



1. In combination with an outbard motor drive unit and boat, including:

a flexible inelastic sack of substantial strength, having one open end;

a plurality of equally spaced grommets placed on said sack, placed on a line substantially parallel to the open end of said sack, and positioned adjacent the open end of said sack;

lacing means;

a rigid shaped frame member completely closed upon itself and having a cicumference substantially equal to that of the open end of said sack, said frame member adapted to receive said open end of said sack, said sack being affixed thereto by said lacing means in cooperation with said grommets and said frame;

a longitudinal handle pivotly fixed on said frame to rotate in a plane perpendicular to the water surface containing said boat, for positioning the combination of said frame and said sack about said outboard motor drive unit;

a stop member including an upwardly extending rectangular bar fixed to said frame and positioned adjacent said pivotly fixed longitudinal handle positioning said handle between said stop member and said frame member, and further, such that said stop member lies in the pivotal plane of said handle, thereby inhibiting all movement of said handle past said stop member; and

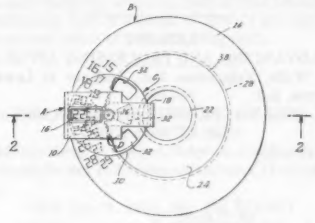
a support strap affixed to the combination of said frame and said sack for holding said combination about said outboard motor drive unit, thereby allowing the filling of the clean liquid into the interior of said sack and retaining said clean liquid in intimate contact with said outboard drive unit, thereby further preventing the outboard drive unit from being in contact with any foreign elements.

3,886,890

CHANNEL INDICIA DISPLAY DEVICE

Richard D. Gibson, Wilbraham, and Robert D. Whelan, Springfield, both of Mass., assignors to General Instrument Corporation, Clifton, N.J.

Filed June 4, 1973, Ser. No. 366,324
Int. Cl. H03j *1/02*
U.S. Cl. 116—124.3 **12 Claims**



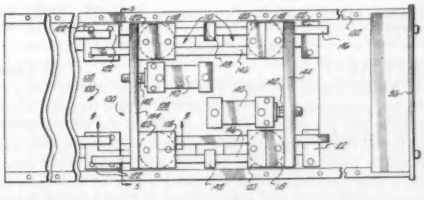
1. A channel designation display device for use in TV or the like comprising a rotatable member having situated thereon two sets of numerals representing channel designations, said sets being arranged on said member in the form of concentric rings, each of said sets forming one of said rings, and masking means comprising a fixed opaque mask situated in front of said disc and having a transparent window aligned with a portion of both of said numeral sets and having a first dimension substantially equal to the combined width of a numeral in each of said sets and the second dimension substantially equal to the height of one of the numerals and, interposed between said member and said window, a rotatable mask having two sets of alternating opaque and transparent regions, said regions being arranged in concentric rings, each of said region sets forming one of said rings, one of said mask rings being offset relative to the other by a given angle, means for operably connecting said rotatable mask to said member, such that the rotation of said member causes said rotatable mask to alternatively mask portions of said window corresponding to first one and then the other of said numeral sets, thus permitting visibility of only a single numeral on one of said numeral sets at any one time.

3,886,891

WORK HOLDER WITH FLUID PURGE MEANS

Donald F. Hardy, Horseheads, N.Y., assignor to Dart Industries Inc., Los Angeles, Calif.

Continuation-in-part of Ser. Nos. 232,455, March 7, 1972, and Ser. No. 232,413, March 7, 1972, Pat. No. 3,765,712. This application June 28, 1973, Ser. No. 374,298
Int. Cl. B05c *11/14*
U.S. Cl. 118—1 **14 Claims**



1. A clamping mechanism adapted to grip an article at one end thereof such mechanism further being suitable for immersion into a first fluid medium and including a split clamp jaw assembly with at least two mating members having in recess therein of the approximate size and shape of said article one end so as to firmly grasp yet loosely surround same, a support

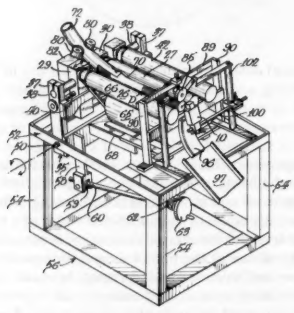
arrangement mounting said members in juxtaposition and opposite one another, actuating means interconnected with said members to alternately move same into contact one with the other and then into said juxtaposition responsive to predetermined signal means at least one of said members further having a conduit communicating with said recess, a fluid source connected with said conduit and recess and propelling a second fluid medium therethrough in such volumes as to exclude said first medium therefrom.

3,886,892

DISC ADVANCING AND PROCESSING APPARATUS

Leroy C. Walls, Valparaiso, Ind., assignor to Lewals, Inc., Chesterton, Ind.

Filed Nov. 20, 1972, Ser. No. 308,145
Int. Cl. B05c *5/00*
U.S. Cl. 118—2 **16 Claims**



1. A disc handling apparatus, comprising,

a. means for supporting a plurality of similar circular discs on edge in adjacent relationship in a generally cylindrically shaped row,

b. means for spinning the discs in the row about the longitudinal axis of the row,

c. means for advancing the row of discs toward a discharge station where the successive discs fall off the supporting means, and

d. means mounted in alignment with said discharge station for momentarily directing a spray of coating fluid toward the spinning end disc at the discharge station before it falls off the supporting means.

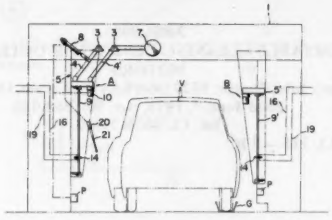
3,886,893

APPARATUS FOR APPLYING WAX TO THE SIDE SURFACES OF VEHICLES

Shigeo Takeuchi, 2, Kiba-cho, Minato-ku, Nagoya, Japan

Filed Aug. 30, 1973, Ser. No. 393,136
Claims priority, application Japan, Nov. 27, 1972, 47-117935
Int. Cl. B05c *5/00*
U.S. Cl. 118—2 **1 Claim**

1. An apparatus for applying wax to the side surfaces of vehicles, comprising: a portal frame structure through which a vehicle can progress, a guide rail laid on the ground under said portal frame structure in a position adjacent to one side thereof to guide the vehicle through said portal frame structure, a wax ejecting system including a pair of wax guns arranged on the opposite side portions of said portal frame structure and having respective orifices directed substantially horizontally and inwardly of said portal frame structure, a first support frame secured to said portal frame structure on that side thereof adjacent to said guide rail, a second support frame hung on said portal frame structure on the opposite side thereof through the intermediary of a parallel link mechanism, two vertical rods journaled on said respective support frames for oscillation about their own axes and respectively supporting said wax guns at substantially the same level, biasing means for normally urging said second support frame to swing outwardly of said portal frame structure, actuator means coupled to said wax ejecting system to operate the same and including a pneumatic actuator operable to cause said second support frame to swing inwardly of said portal frame structure against the bias of said biasing means, sensor means arranged



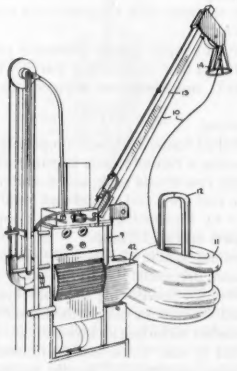
on said second support frame to sense the adjacent side surface of the vehicle progressing through said portal frame structure and operable to control said pneumatic actuator in a manner so that the wax gun associated with said second support frame is held at all times spaced a predetermined distance from the adjacent side surface of the vehicle, and drive means associated with said vertical rods to cause oscillatory rotation thereof about their own axes.

3,886,894

APPARATUS FOR CLEANING AND COATING WIRE

Oliver R. Brekle, Pell City, Ala., assignor to M & B Metal Products Company, Leeds, Ala.

Filed Dec. 14, 1972, Ser. No. 315,201
Int. Cl. B05c *11/06, 5/00*
U.S. Cl. 118—6 **17 Claims**



1. Apparatus for preparing rod for drawing, the rod having brittle scale and other impurities on its outer surface, the apparatus comprising:

feeding means for continuously supplying a substantially constant supply of rod from a rod source comprised of a frame,

a rod receiving means for receiving rod from a rod supply source, said rod receiving means being movably mounted on said frame to move from a first upper position maintaining tension in said rod and a second lower position,

means for detecting the occurrence of a predetermined imperfection in said rod thereby causing said receiving means to move to said second position on said frame,

means responsive to the position of said rod receiving means on said frame, connected to a power supply for the apparatus to shut off the power to the apparatus upon the occurrence of the predetermined imperfection,

a mechanical descaling means receiving said rod from said rod receiving means for bending the received rod to loosen at least a portion of the brittle scale on the outer surface of the rod and adapted to advance the rod to the input of a cleaning means,

said cleaning means cleaning the outer surface of the rod and adapted to receive rod from the descaling means and to advance it in a longitudinal path through the cleaning means, the cleaning means comprising two abrasively coated resilient rotating drums, each of which is mounted on its own shaft having means connected thereto to rotate each of the abrasively coated means about its own shaft in frictional engagement with the outer surface of the rod, means for orbiting both rotating resilient means in an orbit about the circumferential outer surface of the advancing rod, the orbiting and rotational movement of the abrasively coated resilient means scraping the outer surface of the rod to thereby remove substantially all scale from the surface of the rod,

means for coating the cleaned rod received from the cleaning means, the means comprising means for flowing a coating solution on the outer surface of the rod, and means for heating the coated rod to bake the coating on to the cleaned outer surface of the rod, and

means continuously delivering the cleaned, coated rod to the input of the drawing apparatus through which the wire is pulled by the wire drawing apparatus.

3,886,895

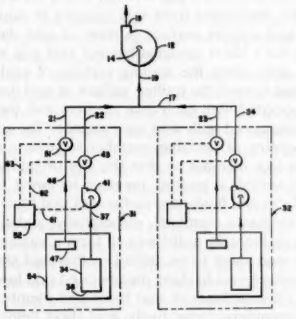
APPARATUS FOR TREATING PARTICULATE MATTER WHILE IN A FLUIDIZED STATE

John Michael Schlamersdorf, Edwardsburg, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Nov. 16, 1972, Ser. No. 307,200

Int. Cl. C23c *13/08*

U.S. Cl. 118—7 **3 Claims**



1. A surge free apparatus for treating particulate matter in a fluidized state in a plurality of treating units each of which operates in a substantially independent manner, the apparatus comprising,

means for causing a flow of gas having an inlet consisting essentially of a manifold having a plurality of intakes, and an outlet, and

a plurality of treating units, each treating unit consisting essentially of a fluidized bed chamber having means for gas flow therethrough and into one of said intakes said chamber gas flow means including means disposed between the chamber outlet and said one intake for boosting flow of gas through said chamber to provide compensation means for pressure loss occurring when treating particulate matter in said fluidized bed chamber, means for bypass gas flow external to said chamber and into another of said intakes, and means for cooperatively regulating flow of gas through said chamber gas flow means and said bypass gas flow means so as to maintain a substantially constant flow of gas from said treating unit into said manifold, whereby, each of said treating units is substantially free of a surge of flow of gas regardless of operational status of other treating units.

3,886,896

DEVICE FOR PLASMA DEPOSITING OF THIN LAYERS ONTO SUBSTRATES

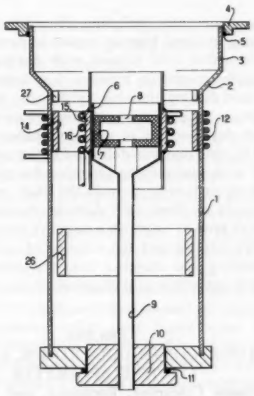
Jean Van Cakenberghe, Beersel, Belgium, assignor to Compagnie Industrielle des Tellecommunications CIT-Alcatel, Paris, France

Filed July 9, 1974, Ser. No. 486,933

Claims priority, application France, July 13, 1973, 73.25855

Int. Cl. C23c *13/12*

U.S. Cl. 118—49.1 **7 Claims**



1. Device for vapor depositing a thin layer under vacuum onto a substrate, comprising:

a chamber kept under vacuum, limited by an insulating wall, one part of which is cylindrical;

means supporting at least one substrate in an upper section of said chamber;

a cylindrical hollow body arranged axially in the cylindrical part of the chamber, lined on its inside with the substance to be deposited, connected to a source of gas arriving in the hollow body at a predetermined pressure and in alignment with said at least one substrate;

an induction coil placed on the outside of the chamber, arranged round the cylindrical part of the chamber, in the vicinity of the latter, at the height of the hollow body and connected to a high-frequency voltage source whereby to generate a plasma to evaporate said substance;

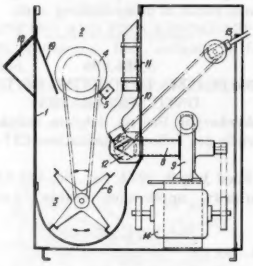
means for concentrating the electromagnetic field inside the hollow body

formed by two concentric conductive cylinders (**14** and **15**) electrically connected together, constituting the secondary winding of an impedance transformer whose primary winding is formed by the induction coil; and means to cool said cylindrical hollow body.

3,886,897
POWDER APPLICATOR

Derek Keith Unwin, Sutton, England, assignor to Chandor Limited, Storrington, England

Filed Feb. 22, 1974, Ser. No. 444,872
Claims priority, application United Kingdom, Feb. 23, 1973, 8864/73
Int. Cl. B05b 7/14
U.S. Cl. 118—309 10 Claims

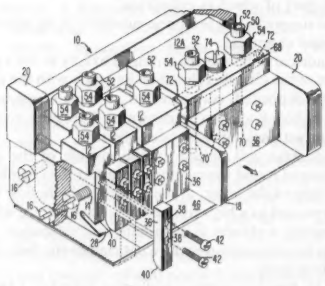


1. Dusting apparatus including an enclosed dusting chamber, a dusting material hopper, means to pervade the gaseous atmosphere within said hopper with dusting material contained therein, means to transfer dust laden air from said hopper to said dusting chamber for delivery to an article to be dusted therein, proportioning means to vary the relative proportions of dust and air in said dust laden air to vary the amount of dusting material delivered to the article, an air filter associated with said dusting chamber for extracting dusting material from air flowing through the filter, and means operative to extract air from said dusting chamber through said filter so as to tend to establish a negative pressure differential between the interior and the exterior of said chamber such that air entering said chamber from the exterior thereof aids the containment within said chamber of the dusting material.

3,886,898
MULTIPLE, CONTIGUOUS STRIPE, EXTRUSION COATING APPARATUS

James Anthony Colegrove, Rochester, and Dunham Briggs Seeley, Fairport, both of N.Y., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 19, 1973, Ser. No. 426,022
Int. Cl. B05c 5/02
U.S. Cl. 118—411 3 Claims



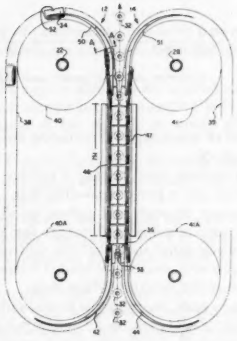
1. Apparatus, for continuously coating a plurality of stripes on to at least one surface of a sheet member, comprising: at least two rigid block-like members, each said block-like member having upper and lower surfaces, one and other side surfaces and leading and trailing surfaces, each said block-like member having an opening therein which extends from said one side surface and along said trailing surface to said other side surface so as to form first and second apertures in said one and other side surfaces, respectively, and a third aperture in said trailing surface, said opening also extending from said third aperture angularly upward toward said upper and leading surfaces, said trailing surface including a generally convex surface portion extending from said lower surface to said third aperture, said convex surface portion also extending from said first aperture and along said trailing surface to said second aperture, said convex surface portion forming a lip at said third aperture, each block-like member also including at least one hole therein which extends from said upper surface to said opening and providing communication between said upper surface and said opening, each said hole being adapted for enabling coating material to enter said hole at said upper surface, enter said opening from said communicating hole and become discharged from said opening over said lip at said third aperture; at least one relatively thin separator member located between each two of said block-like members so as to close said second and first apertures of said one and other side surfaces of said two block-like members, respectively, and to separate coating material in the opening of one block-like member from coating material in the opening of the other of said two block-like members, each said separator member also having an edge surface which is substantially flush with at least said lower surfaces of said two block-like members; at least two rigid end frame members between which said at least two block-like member and intermediate separator member are secured, said first and second apertures of said one and other side surfaces of said two block-like members, respectively, being closed by one and the other, respectively, of said end frame members; at least two rigid block-like dam members, each having upper and lower surfaces, one and other side surfaces and leading and trailing surfaces, each dam member being associated with a different block-like member such that the leading surface of a dam member abuts a trailing surface of a block-like member, each dam member including a generally convex surface portion between its lower surface and its leading surface, the convex surface portions of each block-like member and each dam member associated therewith being spaced-apart to define a gap through which the coating material may be discharged from said opening in said block-like member, said convex surface portion of said dam member extending for a short distance beyond said gap and lip in a direction away from the trailing surface of said block-like member and toward the trailing surface of said dam member; means associated with each dam member and the block-like member associated with said dam member for adjusting the vertical position of said dam member relative to said associated block-like member so that the size of said gap may be selectively varied; a backing member mounted beneath the lower surfaces and flush edge surfaces of said block-like members and separator members, respectively, and spaced-apart from said surfaces by a distance to form a passage sufficient to receive said sheet to be coated so that said sheet is sandwiched between said backing member and said lower surfaces and flush edge surfaces of said block-like members and said separator members, respectively, said sheet being slidable in a direction from said leading surfaces toward said trailing surfaces so that coating materials from each said opening may discharge through said gaps as well as under said extending convex portions of said dam members on to a surface of said sheet in order to form stripes of said coating materials on said surface of said sheet as said sheet is slidably moved, said separator members enabling the discharging coating materials from said openings to form wet seals thereat on said sheet and parallel, stripes of said materials on said sheet so that each said stripe have straight edges; and a support member for said backing member.

3,886,899

MOVING MASK FOR SHIELDING ARTICLES

John R. Johnson, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed June 25, 1973, Ser. No. 372,974
Int. Cl. B05c *11/14*
U.S. Cl. 118—504 22 Claims



1. Apparatus for masking a portion of articles which are traveling in a substantially linear path through an article treatment zone comprising, in combination:

mask means for shielding a portion of each individual article in said treatment zone to prevent treatment of the shielded portion of said article, said mask means including a plurality of complementary pairs of shield members, one of each pair being located on one side of the path of travel of said articles and the other of each pair being located on the opposite side of said path of travel;

transport means connected to said mask means for moving said mask means with said traveling articles;

mounting means, connected to said shield members and said transport means, for supporting said shield members in a location movable toward and away from the path of travel of said articles, said mounting means comprising;

a plurality of complementary pairs of plate members made of resilient material, suspended from said transport means at one end thereof and having the opposite end thereof terminating in a horizontal portion substantially perpendicular to said article and extended substantially to the center line of the path of travel of said articles, said horizontal portion having a cutout portion extending from the peripheral edge of said horizontal portion and shaped to allow a portion of said article to be engaged by said horizontal portion without interference with the travel of said article; and

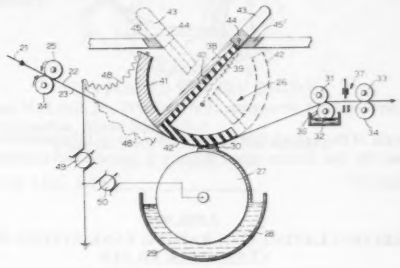
drive means for moving said transport means in synchronism with said articles.

3,886,900

APPARATUS FOR DEVELOPING A LATENT CHARGED IMAGE

Phillippe M. Deshayes, Neuville Les Dieppe, and Guy Paul Weber, Arques La Bataille, both of France, assignors to La Cellophane, Paris, France

Continuation-in-part of Ser. No. 277,059, Aug. 1, 1972. This application July 31, 1973, Ser. No. 384,264
Claims priority, application France, Aug. 2, 1972, 72.27802
Int. Cl. G03G *13/00*
U.S. Cl. 118—637 7 Claims



1. Apparatus for uniformly developing a latent charged image carried on electrophotographic paper having an image side and a reverse side comprising:

a first field member including a main support surface;

a bath of charged liquid toner;

a second field member including a conductive roller partially immersed in said liquid toner bath and having a peripheral surface close to but spaced from said main support surface of said first field member;

transport means for moving the electrophotographic paper past said main support surface with the reverse side contacting said main support surface and the image side facing and spaced from said peripheral surface of said conductive roller;

drive means for rotating said conductive roller at a speed to form a thin layer of liquid toner on said peripheral surface of said conductive roller, said liquid toner forming a meniscus of liquid toner at the surface of the image side of the electrophotographic paper whereby liquid toner is uniformly distributed on the charged areas of the electrophotographic paper;

said main support surface of said first field member including a first conducting support surface and a second non-conducting support surface; and

selecting means for selectively positioning one of said conducting and non-conducting support surfaces in position to support said electrophotographic paper.

3,886,901

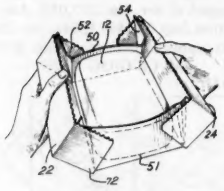
FOLDED CAT BOX AND FILLER MATERIAL PACKAGE

Charles R. Zeitter, Grand Rapids, Mich., assignor to Lowe's, Inc., Cassopolis, Mich.

Filed May 10, 1974, Ser. No. 468,680
Int. Cl. B65d *25/14*
U.S. Cl. 119—1 8 Claims

1. A folded cat box and filler material package, comprising a rectangular bottom panel, end walls connected to two opposite edges of said bottom panel and extending at right angles thereto, side walls connected to the other two opposite edges of said bottom panel and extending at right angles in the same direction as said end walls, foldable corners interconnecting the adjacent ends of said end and side walls, a top panel secured to the upper edges of said side walls and having end sections extending downwardly over the outside surface of said end panels and being secured to the respective foldable corners, a tear strip disposed near the longitudinal center of

said top panel and extending through said end sections for separating said top panel into two sections to form opposite



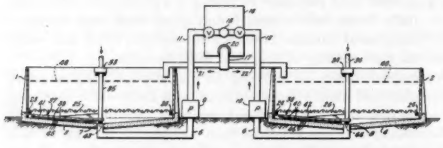
walls of the unfolded box, and a package of litter sealed in said box for use therein when the box is opened and unfolded.

3,886,902

RECIRCULATING FISH RAISING TANK SYSTEM WITH CLEANABLE FILTER

Robert C. Haynes, 1607 Broadman St., Brownwood, Tex. 76801

Filed Jan. 2, 1974, Ser. No. 429,723
Int. Cl. A01k *61/00*
U.S. Cl. 119—3 **6 Claims**



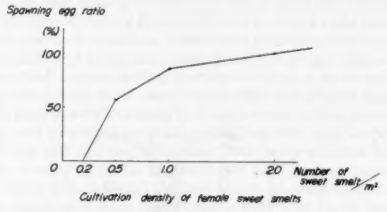
1. A recirculating fish raising tank system with cleanable filter including a filter means, at least one tank, means for removing waste material from each tank and transmitting the waste material with water from each tank into the filter means, means for transmitting the filtered water back into the tank, means for aerating the water in each tank, and means for backwashing and cleaning the filter in which each tank has a bottom which is sloped downwards towards its center in which the means for removing waste material from each tank includes rotating brush means for stirring up the waste material on the bottom of each tank and a drain pipe extending down from the center of the bottom of each tank, in which the means for transmitting the waste material with water from each tank into a filter means includes, in addition to the drain pipe, pump means connected to the drain pipe and pipe running from the pump means into the upper part of the filter means, in which the means for transmitting the filtered water back into each tank includes a pipe running from the lower part of the filter means into each tank, said pipe having numerous perpendicular extensions each having structure defining holes, and in which the means for aerating the water in each tank is also the means for rotating the brush at the bottom of each tank and includes a free swivelling pipe mounted at the center and parellel to the sides of each tank through which compressed air is introduced, said pipe having an extension parallel to the bottom of each tank and structure defining numerous small holes in said extension, the brush elements also being mounted in said extension so that the compressed air emanating from the holes in the said extension aerates the water and causes the extension with attached brush elements to rotate.

3,886,903

METHOD OF SPAWNING AND CULTURING OF SWEET SMELTS

Toshiro Yamada, 32-3. Deki-machi, Anan, Japan

Filed Jan. 17, 1974, Ser. No. 434,002
Claims priority, application Japan, Feb. 8, 1973, 48-15826
Int. Cl. A01k *61/00*
U.S. Cl. 119—3 **7 Claims**



1. A method of spawning and culturing sweet smelts comprising the steps of:

providing a culture pond having a surface with a desired surface area and a gravel spawning bed;

circulating water through said culture pond;

placing hormone-administered mature female sweet smelts in said culture pond such that the cultivation density of said female sweet smelts is at least 0.5 female sweet smelt per square meter of said surface area;

placing mature male sweet smelts in said culture pond, with the number of said male sweet smelts being at least equal to the number of said female sweet smelts;

allowing said male and female sweet smelts to spawn and fertilize eggs;

separating said male and female sweet smelts from said eggs; and

incubating said eggs.

3,886,904

ARTIFICIAL SEA WATER SOLUTION AND COMPOSITION FOR MAKING THE SAME

John M. King, Mentor, Ohio, assignor to Aquarium Systems, Inc., Eastlake, Ohio

Filed July 20, 1973, Ser. No. 381,164
Int. Cl. A01k *61/00*
U.S. Cl. 119—3 **24 Claims**

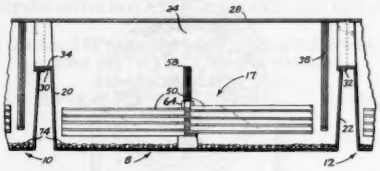
1. A composition which, when dissolved in water, produces an artificial sea water solution, said composition comprising the following ingredients based on the total weight of said composition: about 67.23 to about 68.59 weight percent sodium chloride, about 16.82 to about 17.16 weight percent magnesium sulfate, about 8.50 to about 8.66 weight percent magnesium chloride, about 3.73 to about 3.81 weight percent calcium chloride, about 1.84 to about 1.89 weight percent potassium chloride, about 0.512 to about 0.522 weight percent sodium bicarbonate, about 0.202 to about 0.206 weight percent sodium bromide, about 0.0465 to about 0.0514 weight percent strontium chloride, about 0.0209 to about 0.0231 weight percent sodium silicate, about 0.00928 to about 0.01030 weight percent manganese sulfate, about 0.00492 to about 0.00544 weight percent sodium orthophosphate, about 0.00220 to about 0.00268 weight percent lithium chloride, about 0.00220 to about 0.00268 weight percent sodium molybdate, about 0.00113 to about 0.00138 weight percent aluminum sulfate, about 0.000376 to about 0.000459 weight percent rubidium chloride, about 0.000238 to about 0.000291 weight percent zinc sulfate, about 0.000225 to about 0.000276 weight percent potassium iodide, about 0.000125 to about 0.000153 weight percent cobalt sulfate, and about 0.0000250 to about 0.0000306 weight percent copper sulfate.

3,886,905

FISH PROPAGATION METHOD

William J. McNeil, P.O. Box 1054, Auke Bay, Alaska 99821

Filed Oct. 4, 1973, Ser. No. 403,435
Int. Cl. A01k 61/00
U.S. Cl. 119—3 6 Claims



1. A method of propagating fish from fish eggs comprising preparing on a perforate support submerged in water a deposit of fertilized eggs,

incubating the eggs in said deposit to produce alevins therefrom, which alevins include attached yolk sacs which are the remnants of the eggs from which the alevins were produced,

allowing said alevins with attached yolk sacs to leave said support by escaping downwardly through the perforations of said support,

permitting the alevins on escaping through said perforations to nestle within the interstices of a rugose substrate with the alevins sheltered about their sides by such substrate, and

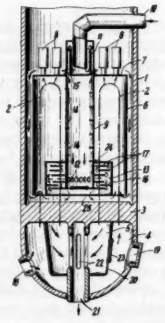
further incubating said alevins with such nestled in the interstices of said substrate during the period that yolk sacs are absorbed by said alevins to produce the fry.

3,886,906

STEAM GENERATOR

Hubert Wolfgarten, Oberhausen, Germany, assignor to Gutehoffnungshutte Sterkade Aktiengesellschaft, Oberhausen, Germany

Filed Dec. 6, 1973, Ser. No. 422,288
Claims priority, application Germany, Dec. 6, 1972, 2259629
Int. Cl. F22b 1/06
U.S. Cl. 122—32 2 Claims



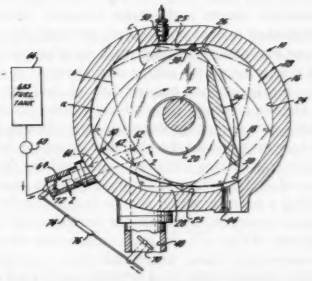
1. A steam generator comprising a casing, a tube sheet, a bundle of U-shaped tubes having inlet and outlet legs mounted within said casing directing the flow of the heating agent, a shell encasing said bundle having a top cover plate, steam separators on said top plate, said bundle of tubes fixedly secured to said tube sheet and arranged symmetrically about the longitudinal axis of the steam generator, a pre-heating chamber encircling said outlet legs near said tube sheet for pre-heating the feed-water, the sides of said chamber extending axially, the supply means lying between the tubes of the tube bundle and extending into said chamber for admitting feed-water into said pre-heating chamber, said supply means comprises a pipe extending near said tube sheet, said pipe comprises outlet openings above said top cover plate, and said outlet openings having a flow throttling means for permitting a specified portion of the feedwater to flow around said steam separators.

3,886,907

GAS FUELED ROTARY ENGINE

Robert W. Loyd, Jr., Wyckoff, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Dec. 12, 1973, Ser. No. 423,881
Int. Cl. F02b 53/04
U.S. Cl. 123—8.13 8 Claims



1. A rotary combustion engine comprising:

a. an outer body having a peripheral wall and axially-spaced side walls defining an internal cavity therebetween and also having first and second intake ports and an exhaust port with the inner surface of said peripheral wall having a multi-lobe profile;

b. a shaft coaxial with said outer body cavity and having an eccentric portion;

c. an inner body of generally polygonal profile journaled on said eccentric portion for relative rotation within said outer body, the apex portions of said inner body having sealing cooperation with said multi-lobe surface to define a plurality of working chambers which vary in volume in response to said relative rotation and the communication of said ports with said chambers being controlled by said relative rotation;

d. a first passage for supplying a gaseous-type fuel at an above atmospheric pressure through said first intake port to said working chambers;

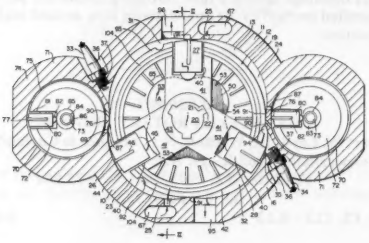
e. a second passage for supplying only air through said second intake port to said working chambers; and

f. said two intake ports being so shaped and positioned that the second port opens to a working chamber before the first port and closes after the first port and in which said first intake port opens to a working chamber after the exhaust port is closed to that chamber.

3,886,908
ROTARY INTERNAL COMBUSTION ENGINE

Ivan Ruzic, 2110 Main St. E., Saskatoon, Saskatchewan, Canada

Filed Dec. 14, 1973, Ser. No. 425,168
Claims priority, application Canada, Oct. 18, 1973, 183753
Int. Cl. F02b *53/08*
U.S. Cl. 123—8.31 8 Claims



1. An internal combustion rotary engine comprising a main stator casing defining a main rotor chamber therein, a main rotor rotatably mounted in said main rotor chamber and combining with said main stator casing to form separate combustion chamber means and intake chamber means, primary vanes mounted in said main rotor, the radially outer end of each vane maintaining contact with an adjacent internal surface of said main stator casing during rotation of said main rotor, each primary vane passing through said combustion and intake chamber means respectively during rotation of said main rotor, intake passage means for transferring a mixture of fuel and air into said intake chamber means, exhaust passage means for transferring exhaust gases resulting from combustion out of said combustion chamber means, ignition means for igniting a mixture of fuel and air in said combustion chamber means, compression means for compressing a quantity of said mixture of fuel and air, said compression means comprising a compressor stator casing defining a compressor rotor chamber, a compressor rotor rotatably mounted in said compressor rotor chamber and combining with said compressor stator casing to form a compression chamber, said compressor stator casing being located radially outwardly from the centre axis of the main rotor and separated from said main rotor chamber, first passage means for transferring a quantity of said mixture of fuel and air in said intake chamber means to said compression chamber, second passage means for transferring a compressed quantity of said mixture of fuel and air from said compression chamber to said combustion chamber means, release means for releasing said compressed quantity of fuel and air into said combustion chamber means through said second passage means in timed relation with respect to the passage of each of said primary vanes through said combustion chamber means, wherein said release means comprise recesses in the periphery of the main rotor, one recess being located to the rear of and spaced apart a predetermined distance from each primary vane, the rearward position of each recess being relative to the direction of rotation of the main rotor and said predetermined distance determining the time of release of said compressed quantity into said combustion chamber.

3,886,909
ROTARY INTERNAL COMBUSTION ENGINE

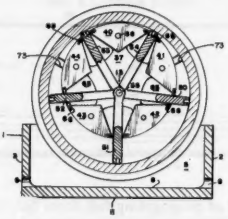
Vernon L. Balsbaugh, Rt. 2, Box 68, Dallas, Oreg. 97338

Continuation-in-part of Ser. No. 155,773, June 23, 1971, abandoned. This application June 11, 1973, Ser. No. 369,089
Int. Cl. F02b *55/14*
U.S. Cl. 123—8.45 12 Claims

1. An internal combustion engine comprising:

a pair of rotors and means for interconnecting said rotors for rotation at different speeds for progressive relative rotation,

and dividing means between said two rotors to form therebetween combustion, exhaust, intake and compression



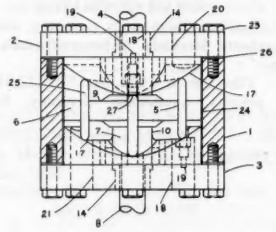
chambers as the two rotors rotate and one progresses with respect to the other,

wherein said dividing means extend from one rotor in slidable contact with the other rotor as one of said rotors progresses with respect to the other, the axes of said rotors being offset.

3,886,910
ROTARY, MULTI-CHAMBERED, INTERNAL COMBUSTION ENGINE

Richard Arnold Vrooman, 22628 87th West, Edmonds, Wash. 98020

Filed Oct. 12, 1973, Ser. No. 405,868
Int. Cl. F02b *55/14*
U.S. Cl. 123—8.45 4 Claims



1. In a rotary internal combustion engine, a circular housing enclosing a circular disk rotor coincident and symetrical about the same centerline, multiple radially oriented slots machined in the rotor disk in which is fitted multiple gas seal barriers constrained in displacement means parallel to said rotor disk center-line axis thus joined with the rotor to form a single assembly, said gas seal barriers trapped between two contoured cam surfaces means functioning as force transmitters for inducing motion to said rotor disk, left and right hand cover plates enclosing upon and supporting by bearing means said rotor assembly forming an integral structure by attaching bolt means with the circular housing enclosing said rotor disk and multiple gas seal barriers, said left and right hand cover plates contain integrally contoured cam surfaces displacement means with left hand cover plate maximum displacement means coincident to right hand cover plate minimum displacement means, combustable mixture ignition means located at or near maximum compression position contoured cam displacement means; combustable mixture intake means through each cover plate into combustion chamber formed by any two adjacent gas seal barriers, the contoured cam surface, the rotor disk face, and the rotor hub surface; combustable mixture compressing or expanding means as contoured cam profile increases or decreases displacement means, exhaust

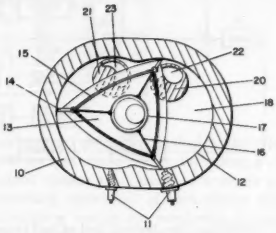
means through cover plates expelling spent combustable mixture from said combustion chamber, power output means through shaft attaching means to rotor disk hub.

3,886,911

INTERNAL COMBUSTION TROCOIDAL ROTARY ENGINES WITH ROTATABLE INTAKE AND EXHAUST PORTS

Otto G. Glatt, 169 Boiling Springs Ave., East Rutherford, N.J.

Filed Dec. 17, 1973, Ser. No. 425,521
Int. Cl. F02b *55/14, 53/06*
U.S. Cl. 123—8.45 **5 Claims**



1. A rotary internal combustion engine of the trochoidal type comprising:
   - a housing having epitrochoidal inner chamber of at least two lobes,
   - a triangularly shaped rotor eccentrically journalled within said housing,
   - seal means on said rotor whereby said seal means are in sealing relationship with the surface of said epitrochoidal chamber,
   - at least two spark plugs mounted on said housing,
   - an intake port means and an exhaust port means, each of said port means having a variable opening means for rotatably journalling said intake port means and exhaust port means on said housing,
   - and means responsive to the speed of said engine for controlling the rotation of said respective port means to vary the exposed opening of said respective variable port opening accordingly whereby the size of the port opening increases with engine speed.

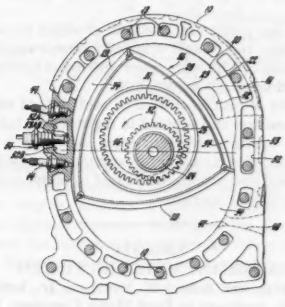
3,886,912

ROTARY ENGINE HEAT SENSING ARRANGEMENT

Robert J. Haglund, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 8, 1974, Ser. No. 440,666
Int. Cl. F02b *55/14*
U.S. Cl. 123—8.47 **3 Claims**

1. An internal combustion rotary engine having a stationary body comprising a rotor housing having an outer peripheral wall and a multi-lobed inner peripheral wall and a pair of end wall housings having oppositely facing internal end walls cooperatively defining a cavity, a crankshaft rotatably mounted in said stationary body having an eccentric located in said cavity, a multi-apex rotor rotatably mounted on said eccentric having sides opposite said end walls and a plurality of faces opposite said inner wall, means for causing said rotor and said crankshaft to turn in a fixed speed relationship while said rotor planetates with a fixed relationship to said rotor housing, said rotor faces and said end walls and said inner wall cooperating to provide a plurality of working chambers that are spaced about and move with said rotor within said rotor housing while varying in volume as said rotor planetates, said stationary body having an intake passage that is opened by said rotor to said chambers as they expand to deliver an air-fuel mixture thereto, a spark plug mounted in said rotor housing for igniting the air-fuel mixture in said chambers, said stationary body having an exhaust passage that is opened by said rotor to said chambers during their contraction to receive exhaust gas therefrom, peripherally spaced axially extending coolant passages in said rotor housing spaced by radially extending ribs between said inner wall and said outer wall, and heat sensor means including a heat input body connected to only said outer wall in the hotest region of said rotor housing and received with space completely thereabout in a hole in one of said ribs so as to be open to coolant in the coolant passages



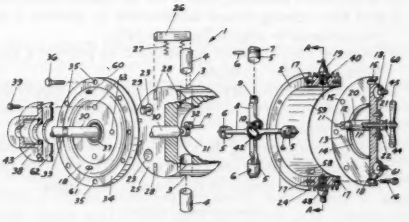
normally separated by said one rib, said heat input body having its most direct heat input area at the inner end thereof spaced opposite and closest to the outer side of said inner wall so that said heat sensor means senses the heat of said inner wall by convection and also conduction through coolant between said most direct heat input area and said inner wall and when there is no coolant by radiation through the space normally occupied by coolant and also conduction through said one rib and the connection of said heat input body with said outer wall.

3,886,913

ROTARY-PISTON INTERNAL COMBUSTION ENGINE

James G. Blanchard, 2022 S. Kirkwood St., Shreveport, La. 71108

Filed May 22, 1974, Ser. No. 472,499
Int. Cl. F02b *57/02*
U.S. Cl. 123—44 D **10 Claims**



1. A rotary-piston internal combustion engine comprising:
   a. a housing fitted with at least one fuel ignition means, intake and exhaust ports, and an essentially cylindrical housing inside surface;
   b. a forward cover plate in removable cooperation with the forward end of said housing and a rear cover plate in removable cooperation with the rear end of said housing to close said housing;
   c. a rotor having a cavity partially through the center thereof and a plurality of opposed cylinder apertures radially disposed therein, said cylinder apertures commu-

nicating from the outer periphery of said rotor to said cavity;

d. a shaft carried by said rotor, one end of said shaft being journaled for rotation in said forward cover plate and the opposite end of said shaft terminating in said cavity;

e. a hollow drive pin mount fitted in cooperation with said rear cover plate;

f. a drive pin journaled for rotation in said hollow drive pin mount;

g. coupling means in cooperation with said opposite end of said shaft and said drive pin to effect rotation of said drive pin when said rotor is caused to rotate and said shaft rotates;

h. at least one piston arm, the ends of which are adapted to extend into two of said opposed cylinder apertures, and the centers of which are fitted with a slot for engagement with said drive pin mount; and

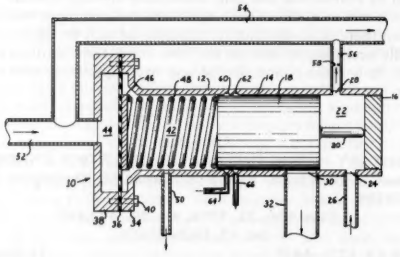
i. a plurality of pistons carried by said ends of said at least one piston arm and adapted to register with said opposed cylinder apertures whereby when said rotor is caused to rotate, said slot in said piston arm traverses said drive pin mount and said pistons are caused to reciprocate radially in said cylinder apertures.

3,886,914

LUBRICANT METERING SYSTEM

Daniel C. Ahrns, and Robert W. Morrison, Jr., both of Westland, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 14, 1973, Ser. No. 424,985
Int. Cl. F01m *1/18*
U.S. Cl. 123—73 AD **11 Claims**



1. A lubricant metering system for an engine comprising:

a fuel flow sensing means constructed to provide a signal proportional to engine fuel flow rate,

a lubricant supply means constructed to provide a flow of lubricant under pressure,

a lubricant metering device connected to said supply means and constructed to control the flow of lubricant from said supply means,

said lubricant metering device being connected to said fuel flow sensing means and constructed to portion the output of said supply means in response to said signal.

3,886,915

PASSIVE ADAPTIVE ENGINE CONTROL SYSTEM FOR IMPROVED VEHICLE DRIVEABILITY

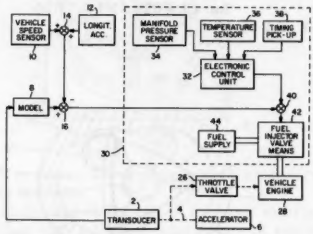
Lael B. Taplin, Livonia, Mich., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Sept. 28, 1973, Ser. No. 401,760
Int. Cl. F02d *11/10;* **B60k** *31/00*
U.S. Cl. 123—102 **8 Claims**

1. In a vehicle engine of the type whereby the engine is operator controlled through an accelerator, the improvement comrpising:

means connected to the accelerator and responsive to the operator controlled displacement thereof for providing a signal corresponding to a desired response of the vehicle, including a transducer connected to the accelerator for providing a signal corresponding to the displacement thereof and a model connected to the transducer and responsive to the signal therefrom for providing the desired vehicle response signal;

means for providing a signal corresponding to the actual response of the vehicle;



means for combining the desired and actual response signals and for providing a signal corresponding to the difference therebetween; and

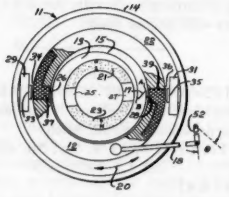
means connected to the difference signal means, the accelerator and the engine for controlling the engine in response to the difference signal and the accelerator displacement.

3,886,916

TIMING MECHANISM FOR BREAKERLESS IGNITION SYSTEMS

Robert McDougall Henderson, Williams Bay, Wis., assignor to Colt Industries Operating Corp., New York, N.Y.

Continuation-in-part of Ser. No. 242,324, April 10, 1972, abandoned. This application Aug. 20, 1973, Ser. No. 389,680
Int. Cl. F02p *5/02*
U.S. Cl. 123—117 R **6 Claims**

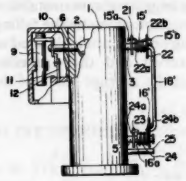


1. A timing mechanism for a breakerless ignition system, comprising, in combination, a rotor, means for providing a magnetic flux field, a flux responsive means including a triggering coil, a triggering core for the coil, a mechanically adjustable element movable to a selected angular position relative to said triggering core, magnetic pole piece means mounted with said element, said pole piece means including a flux conductor section and a pole shoe section, said rotor including a discrete triggering point on its periphery, said rotor moving past the flux conductor section and thereby developing a triggering signal, the manually adjustable element being movable to move the pole piece means, and said pole piece means when moved being effective to change the point at which triggering occurs, while still maintaining a section of the pole shoe adjacent said triggering core so as to develop a trigger voltage of a selected amplitude.

3,886,917
CARBURETOR WITH AUTOMATIC CHOKE

Masahiko Nakada; Hirobumi Matsumoto, and Nobuyuki Kobayashi, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed June 5, 1973, Ser. No. 367,220
Claims priority, application Japan, July 13, 1972, 47-69620
Int. Cl. F02m *1/10, 1/02*
U.S. Cl. 123—119 F **1 Claim**



1. In a carburetor assembly having a throttle valve and equipped with an automatic choke including a choke valve, and thermostatic means responsive to exhaust gas temperature for controlling operation of said choke valve, the improvement including means for rendering operation of said choke valve dependent upon the position of said throttle valve, said improvement comprising, in combination,

a choke valve shaft connected with said choke valve to rotate concurrently with displacement thereof,

a throttle valve shaft connected with said throttle valve to rotate concurrently with displacement thereof,

a throttle lever revolvably mounted upon said throttle valve shaft,

a choke arm revolvably mounted upon said choke valve shaft,

means defining a slot in said throttle lever,

a linkage arm connected between said choke arm and said slot in said throttle lever,

a choke valve coil spring, concentrically located about said choke valve shaft and having a pair of ends, with one of said ends connected to impart a spring force to said choke valve shaft and with the other of said ends being connected to said choke arm, and

a throttle valve coil spring concentrically located about said throttle valve shaft and having a pair of ends, one of said ends being connected with said throttle valve shaft and the other of said ends being connected with said throttle lever,

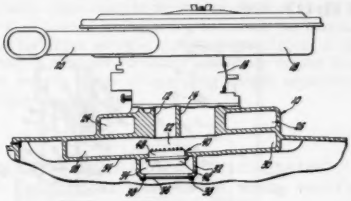
said slot in said throttle lever being configured to impart a force from said throttle lever to said linkage arm only after said throttle lever has reached a predetermined position by displacement of said throttle valve beyond a predetermined location.

3,886,918
HEATED MANIFOLD

Edward N. Cole, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 4, 1973, Ser. No. 394,186
Int. Cl. F02m *31/00*
U.S. Cl. 123—122 AC **4 Claims**

1. A heated manifold assembly for use in evaporating fuel particles during cold engine starts comprising an intake manifold having a carburetor riser bore therein, an induction passage within said intake manifold for receiving air-fuel mixture from the carburetor riser bore, transverse runners in said manifold for directing air-fuel mixture from the induction passageway to intake valves of the engine, means including a box having openings for collecting liquid fuel droplets from said riser bore, a heat transfer plate located in said box below the intake riser bores in the floor of the intake manifold, means for heating the heat transfer plate with exhaust flow for raising the temperature thereof upon cold engine start, valve means located in said induction passage between said riser bore and said box openings for diverting intake air-fuel mixture into said box and against said heated plate during cold engine start, said valve means including means responsive to engine temperature for closing said box openings to reduce

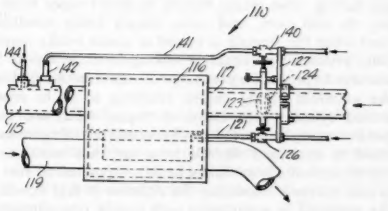


flow of air-fuel mixture across said heated plate and diverting said flow from the induction passage to the transverse runners when the engine reaches a predetermined temperature thereby to prevent excessive heating of the air-fuel mixture passing from the carburetor to the intake valves of the engine when it is heated to a predetermined temperature level.

3,886,919
LIQUID FUEL GASIFIER

Allen M. Freeman, 4133 Moriah Way, North Highlands, Calif. 95660

Filed Aug. 8, 1973, Ser. No. 386,547
Int. Cl. F02m *17/18*
U.S. Cl. 123—133 **2 Claims**

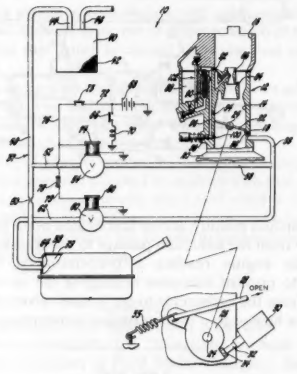


1. A fuel system for internal combustion engines comprising an exhaust pipe extending from said internal combustion engine, a chamber, said exhaust pipe extending through said chamber with said chamber sealed to said exhaust pipe, a hollow tube extending into said chamber and having an open end directed toward said exhaust pipe for directing liquid fuel against said exhaust pipe, conduits connected to the upper portion of said chamber for directing a flow of air through said chamber, a baffle extending generally horizontally in said chamber above said hollow tube and below said conduit for concentrating the exhaust pipe heat on the fuel while preventing the flow of air from contacting said exhaust pipe, said baffle being spaced from the sides of said chamber to permit fuel vaporized on said exhaust pipe to rise and mix with the air flowing through said chamber, a liquid fuel control valve connected to said hollow tube, a butterfly valve mounted in the conduit extending to said chamber for controlling the flow of air through said chamber, manually adjustable mechanical means interconnecting said liquid fuel control and said butterfly valves to permit adjustment of the air/fuel ratio provided by said valves, and manually controlled means connected to said mechanical means for simultaneously controlling said valves.

3,886,920
AUTOMOTIVE VAPOR CHOKE

Henry J. Van Dusen, III, Huntington Woods, and Paul T. Vickers, Royal Oak, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 12, 1974, Ser. No. 460,442
Int. Cl. F02m 59/00
U.S. Cl. 123—136 3 Claims



1. In a vapor choke system for an internal combustion engine of the type including a throttle controlled air-fuel supply carburetor for fuel flow to an intake manifold the improvement comprising: means including a throttle position solenoid for closing the throttle during engine cranking operations, means defining a vapor port in communication with the intake manifold, a vaporized fuel air source, first vapor supply means having valve means therein to direct vapor from said source to said port, said valve means being conditioned opened when the throttle is closed to cause intake manifold vacuum produced by engine cranking to draw vapors from said source to produce a precharge of vaporized air-fuel in the intake manifold during engine cranking so as to produce improved cylinder combustion at engine start, and means responsive to engine start to condition said throttle positioning solenoid to open said throttle to a curb idle position, and means to sequentially modulate further vaporized air-fuel flow from said source to modulate the richness of fuel flow to the intake manifold in accordance with engine operating conditions.

3,886,921
ELECTRONIC CONTROL SYSTEM FOR THE VELOCITY OF A MACHINE ELEMENT

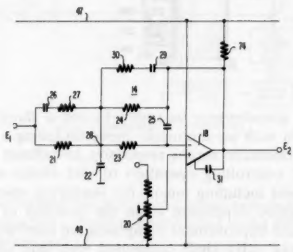
Gunther Hafner, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Apr. 25, 1972, Ser. No. 247,335
Claims priority, application Germany, Apr. 26, 1971, 2120459
Int. Cl. F02m 39/00
U.S. Cl. 123—139 E 29 Claims

1. An apparatus for controlling a Diesel engine at a predetermined velocity comprising an injection pump means for injecting a controlled amount of fuel into the engine and an electronic control means attached to an end face of said pump means for controlling the amount of fuel injected into the engine, said electronic control means including

a transmitter means producing an a.c. voltage having a frequency proportional to the actual velocity of the engine and having an electric signal derived from the a.c. voltage which actuates a control element influencing the velocity of the machine element in the sense of a cancellation of a deviation from the predetermined velocity, said transmitter means being a premagnetized inductive pick-up means responding to the passing of the teeth of a gear of the engine, ,

a pulse former means operatively connected to the transmitter means which forms from the a.c. voltage substantially rectangular pulses of substantially equal length and substantially equal height having a frequency proportional to the velocity, wherein rectangular pulses are formed in the pulse former means from the a.c. voltage supplied by the transmitter means and of these rectangular pulses the falling flanks are used for triggering a monostable multivibrator means which, after unblocking by the falling flank, remains unblocked during an accurately defined substantially constant time interval and then reverts to its blocked condition so that the average value of the pulse



output corresponds to the velocity of the machine element as represented by the rotational speed of the gear, said operating voltage of the multivibrator means being stabilized by means of a Zener diode, the stabilized voltage source for the comparison voltage being derived from the Zener diode to which is also connected the multivibrator means,

a control stage means operatively connected with the pulse former means in which a d.c. voltage representing the desired velocity is compared with the electric signal reproducing the actual velocity and a d.c. output voltage is produced proportional to the deviation from the desired value,

said control stage means being operable as a proportional control element with simultaneous differentiating, integrating and low-pass effect, wherein the limit frequency of the low-pass lies below the frequenices of the transmitter means,

an output stage means operatively connected with the control stage means and operable to control the control element corresponding to the output signal of the control stage means,

means for achieving the low-pass effect, said means including the pulse output of the pulse former means being connected with one input of an operational amplifier means of the control stage means by way of an RC-element and by way of a resistor having a resistance value approximately equal to 1/5 to 1/10 of the resistance of the RC-element and connected in series with the resistor of the RC-element and the output of the operational amplifier means of the control stage means being connected by way of a high ohmic negative feedback means with the point of connection of the aforementioned resistors and by way of a condenser with said one input, wherein the pulse output of the pulse former means is additionally connected to said point of connection by way of a series circuit including a further condenser and a further resistor, the capacity of said further condenser being larger and the value of said further resistor being smaller than the corresponding values of the parallel-connected RC-element,

a series circuit consisting of condenser and resistor means connected in parallel to the high ohmic negative feedback

means, the resistance of said last-mentioned resistor means being considerably smaller than the high ohmic negative feedback means,

said operational amplifier means of said control stage means being provided with an output compensation including a condenser means of small capacity, and

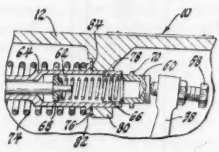
means for chopping the d.c. output voltage of the control stage means in the output stage means into a rectangular pulse voltage with an average value substantially equal to the d.c. output voltage of the control stage means and for feeding to an adjusting magnet consituting the control element, wherein the adjusting magnet constituting the control element is prestressed in the closing direction by a spring.

3,886,922

ENGINE SPEED GOVERNOR WITH PEAK LOAD CONTROL

Charles H. Frick, Pontiac, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 17, 1973, Ser. No. 397,964
Int. Cl. F02d *1/04*
U.S. Cl. 123—140 R **3 Claims**



1. A maximum-minimum speed limiting governor in combination with a compression-ignition engine having a fuel rack actuator for varying fuel input to the cylinders, said governor comprising

a housing,

first actuating means in said housing and connectible with such fuel rack actuator, said actuating means being movable between maximum and minimum fuel positions,

engine speed responsive means in said housing and connected with said first actuating means, said speed responsive means being movable between maximum and minimum speed positions and arranged such that movement thereof toward said maximum speed position moves said first actuating means toward its minimum fuel position and movement of said speed responsive means toward its minimum speed position moves said first actuating means toward its maximum fuel position,

support means in said housing and having a cylindrical bore with an annular abutment surrounding said bore at one end thereof,

a cylindrical plunger received for reciprocating movement in said bore, said plunger having an annular flange extending axially opposite said abutment,

a cap member reciprocably received within a recess in said plunger and low speed spring means in said recess and biasing said cap member outwardly therefrom and into engagement with and urging said speed responsive means toward its maximum speed position, said cap member having a flange stop thereon engagable with the end of said plunger to limit compression of said low speed spring and provide a non-yielding connection between said plunger and said speed responsive means at operating speeds above a preset engine idle speed,

a high speed spring received on said plunger and acting between said annular flange and said housing so as to bias said annular flange toward said support abutment, and

a peak load control spring acting between said abutment and said annular flange and opposing the bias of said high speed spring during the initial portion of the travel of said plunger flange away from said abutment,

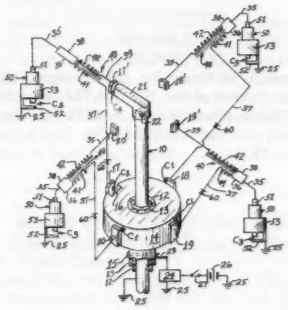
said speed responsive means being operable to apply a force increasing with increasing engine speed against said low and high speed springs through said cap member and plunger such that said low speed spring is partially compressed in the idle speed range and said high speed spring is partially compressed in the maximum speed range, said peak load control spring acting to reduce the maximum engine fuel input near the maximum speed range so as to maintain a relatively constant maximum engine horsepower over a range of operating speeds adjacent the maximum speed range.

3,886,923

INDUCTIVE DISCHARGE IGNITION SYSTEM

Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Filed July 11, 1973, Ser. No. 378,273
Int. Cl. F02p *1/00;* **H01h** *39/00*
U.S. Cl. 123—148 DC **8 Claims**



1. An ignition system having igniters, and a shaft driven during operative mode of said system, the combination comprising:

first rotary switching means comprising a generally circular member driven by said shaft during said operative mode, said member having an outer periphery, an aperture at said outer periphery, and a plurality of first electrode means at said outer periphery positioned at regular intervals,;

a plurality of transformers, each of the transformers having a primary and secondary winding, one of the primary windings being connected to only one of said first electrode means; and

second rotary switching means comprising an arm one end of which is mounted on said shaft and the other end of said arm describing a circular path during said operative mode, and a plurality of second elecrode means, equal in quantity to said first electrode means, positioned at locations described by said circular path at regular intervals, one of the secondary windings being connected to only one of said second electrode means.

3,886,924

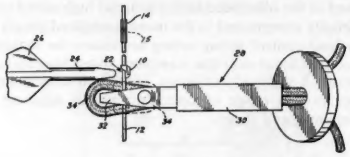
ARCHERY BOW WITH NOCKING POINT ON THE BOWSTRING

John C. Chesnick, 4070 Marshall, Wheat Ridge, Colo. 80033

Filed Aug. 16, 1971, Ser. No. 172,125
Int. Cl. F41b *5/00*
U.S. Cl. 124—23 R **5 Claims**

1. In an archery bow wherein a bowstring is stretched between opposite ends of the bow and an arrow has a nock at one end provided with a notch to receive the bowstring, the improvement comprising:

a nocking point attached to the bowstring including a collar affixed in surrounding relation to the bowstring and an alignment tail connected to and extending from said collar in closely spaced parallel relation to the bowstring, and said alignment tail further extending rearwardly of



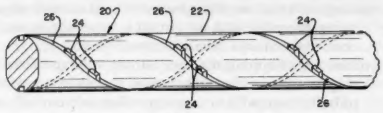
the bowstring to define a nocking position on the bowstring adjacent to said collar and insertable with the bowstring into the open notch at the end of the arrow to prevent twisting of the bowstring relative to the arrow when the arrow is positioned on the nocking point.

3,886,925
CUTTING WHEEL
Barrie F. Regan, 1760 Manor Dr., Hillsborough, Calif. 94010
Continuation-in-part of Ser. No. 371,712, June 20, 1973, abandoned. This application Sept. 9, 1974, Ser. No. 504,449
Int. Cl. B28d *1/04*
U.S. Cl. 125—15 **1 Claim**

1. An improved cutting wheel for dicing semi-conductor wafers which comprises a wheel body having a hub portion and an integral peripheral flange surrounding said hub portion with said hub portion having a shoulder extending axially from said flange, a cutting disc having a thickness in the range 0.001 to 0.20 inch formed of abrasive particles embedded in an electroformed matrix of nickel electroformed onto said flange on the same side thereof as said shoulder and projecting radially from said flange, a support ring having a diameter sufficiently less than that of the cutting disc to leave the periphery of the cutting disc exposed mounted on said hub engaging said shoulder with said support ring engaging said cutting disc, and a layer of elastomeric adhesive between said ring, said flange and said cutting disc.

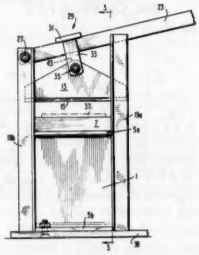
3,886,926
WIRE SAW
George H. Hall, P.O. Box 244, Westford, Mass. 01886
Filed July 19, 1973, Ser. No. 380,831
Int. Cl. B28d *1/08*
U.S. Cl. 125—21 **7 Claims**

1. A wire saw comprising, in combination;
an elongated, flexible, substantially cylindrical, metallic body having at least one helical slot along its length, and a plurality of blocks of composite, comminuted abrasive in a bonding matrix mounted in said slot in spaced apart relation along said body by a braze comprising a layer of an elastically pliant metal having high thermal conductivity bonded to both said body and blocks by a metallic



material which has a melting point below the melting point of both said matrix and body.

3,886,927
STONE CUTTER
John Henry Chattin, 10603 Crocus St., Orlando, Fla. 32807
Filed Feb. 25, 1974, Ser. No. 445,764
Int. Cl. B28d *1/32*
U.S. Cl. 125—23 C **4 Claims**



1. A portable, manually operated, non-hydraulic cutting device capable of accurately cutting a relatively thin and hard piece of stone comprising a stationary first blade means and a movable second blade means, each of said blade means having a substantially continuous cutting edge defined by two intersecting surfaces, each of said surfaces being inclined at an angle of less than 90° but greater than 0° from the common aligned plane of said cutting edges; guide means slidably retaining said movable second blade means at its lateral ends and aligning said stationary first blade means with said movable second blade means such that the cutting edges of said stationary first blade means and said movable second blade means are retained in substantially the same plane; anvil means located above said movable blade means for receiving a precussion blow and transmitting the force of said blow to the blade means thereby driving said blade means toward each other to cause the cutting of said stone; downwardly extending means connecting said anvil means to said movable blade means by a pivotal connection located at a point intermediate the lateral ends of said movable blade means, said movable blade means being retained in said guide means so as to be capable of substantial pivotal movement about said pivotal connection; and handle means extending between said guide means and extending between said anvil means and said movable blade means for moving said movable second blade means into and out of cutting alignment with said stationary first blade means.

3,886,928
DEVICE FOR THE EXTRACTION OF BLOOD
Walter Sarstedt, 5223 Numbrecht, Rommelsdorf, Germany
Filed Oct. 13, 1972, Ser. No. 297,219
Claims priority, application Germany, Oct. 13, 1971, 2150884; Sept. 16, 1972, 2245584
Int. Cl. A61m *1/00*
U.S. Cl. 128—2 F **9 Claims**

1. A device for the extraction of blood by means of a suction effect comprising a tube having a closed end and an open end,

a one-piece piston assembly cooperatively telescoped within said tube, said piston assembly comprising a piston having an

aperture therethrough, a hollow piston rod extending from said piston in communication with the aperture therein and extending out through said tube open end, said piston being in sealed engagement with the interior of said tube and said piston rod having axially elongated generally radially extending wings guidedly engaging the interior of said tube, said piston rod having a free end in the form of means for the reception of a needle in sealed engagement, a transversely disposed handle on said piston rod adjacent said free end for withdrawing said piston assembly from said tube to produce a suction within said piston rod, said hollow piston rod has a tapered bore, said bore decreasing in cross section from said piston towards said free end whereby a maximum suction is effected at said piston rod free end.

3,886,929

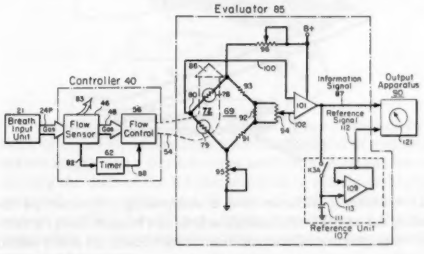
BREATH TESTER NULL MEMORY SYSTEM

Joseph P. Hoppesch, Streamwood; Donald H. Ward, Glen Ellyn, and James R. Tomashek, Wooddale, all of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 181,805, Sept. 20, 1971. This application May 4, 1973, Ser. No. 357,154

Int. Cl. A61b *5/08*

U.S. Cl. 128—2 C **2 Claims**



1. A breath alcohol concentration detection system comprising:

breath input unit means for receiving deep lung breath from a subject;

means for sensing the flow of gas through said input unit;

an evaluator connected to receive a sample of the gas flowing through the input unit, to evaluate the alcohol concentration in the received gas sample, and to produce an output signal in response to the detected alcohol concentration, said evaluator including:

an alcohol detector including a bridge circuit which receives the gas sample from the input unit, and which produces an information signal that varies with the alcohol concentration of the received gas sample;

means for providing a reference signal, comprising signal storage means connected such that operation of the detector prior to receiving the gas sample from the breath input unit establishes said reference signal based on the imbalance initially present in the detector bridge circuit, which reference signal is stored in the signal storage means for subsequent use in comparison with the information signal, to minimize drift problems and enhance accuracy in the system;

a comparator, coupled both to the means for providing a reference signal and to said detector, for comparing the information signal with the stored reference signal and for producing a "fail" output signal whenever the information signal from the detector reaches a predetermined relationship with respect to the reference signal;

output apparatus means connected for operation in response to receipt of the output signal from said evaluator; and

means, operative in response to said flow sensing means, for insuring that said output apparatus is activated, in response to the output signal of said evaluator indicating the gas sample is from said deep lung breath, resulting from an essentially continuous and uninterrupted flow of breath over a threshold level for a predetermined period of time of such a duration to insure that the gas sample obtained is deep lung breath.

3,886,930

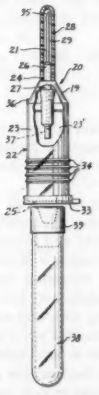
BLOOD COLLECTING ASSEMBLY

George R. Ryan, Waukegan, Ill., assignor to Abbott Laboratories, Inc., North Chicago, Ill.

Continuation of Ser. No. 138,990, April 30, 1971, abandoned, which is a continuation-in-part of Ser. No. 715, Jan. 5, 1970, abandoned. This application Nov. 28, 1973, Ser. No. 419,659

Int. Cl. A61b *5/14*

U.S. Cl. 128—2 F **7 Claims**



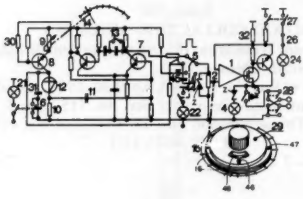
1. A holder, cannula and valve assembly for collecting blood, comprising: a holder having a generally tubular longitudinally extending passageway open at one end and having an end portion opposite the open end, a cannula extending longitudinally and connected to the end portion of said holder, said cannula having an interior marginal end terminating in the passageway at a piercing end and having an exterior marginal end extending exteriorly of said holder and terminating at a vein-piercing end, said interior marginal end having an opening through which blood can pass, valve means received about said interior marginal end of said cannula and connected to

said holder, said valve means including air vent means providing communication from said cannula opening, through said air vent means, into said passageway, and to the atmosphere, and mounting means for said valve means connected to the end portion of said holder and enabling lengthwise shifting movement of the valve means relative to the cannula from a first position in which said cannula opening communicates with the atmosphere to provide a blood telltale at said cannula opening when said vein-piercing end has pierced the vein of a patient to a second position at which said cannula opening is closed off from the atmosphere by said valve means to prevent additional blood from passing out of said cannula opening until blood is to be collected, said valve means being composed of a material which is cannula pierceable, resealable and sufficiently transparent to enable visual observation of the blood telltale through the valve means.

3,886,931
ELECTRODIAGNOSTIC APPARATUS

Hans Rodler, Karntnerstrasse 161, 8053 Graz-Neuhart, Austria

Filed Dec. 1, 1972, Ser. No. 311,263
Claims priority, application Austria, Dec. 1, 1971, 10360/71
Int. Cl. A61b *5/05*
U.S. Cl. 128—2.1 R **7 Claims**



1. An electrodiagnostic apparatus comprising:

constant-current-generating means provided with adjusting means for varying the magnitude of the output current thereof;

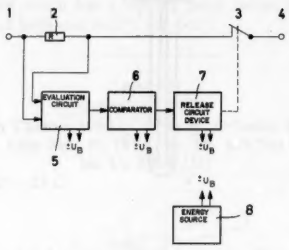
mode-selector means connected to said constant-current-generator means for alternately positioning same in a sawtooth-wave mode and in a square-wave mode; and

indicator means including a stationary support carrying a logarithmic scale, a setting member displaceable relatively to said support and provided with first marking means co-operating with said scale to give an accommodation-threshold reading upon a testing of a patient with said output current in said sawtooth-wave mode, and a coacting member displaceable relatively to said support independently of said setting member and provided with second marking means co-operating with said scale to give a rheobase reading upon a testing of a patient with said output current in said square-wave mode, at least one of said members being coupled with said adjusting means for entrainment thereby, said setting member being further provided with numerical indicia and said coacting member being further provided with third marking means co-operating with said indicia for giving an accommodation-quotient reading upon displacement of said members into positions respectively determined by said adjusting means during rheobase and accommodation-threshold measurements.

3,886,932
OVERCURRENT PROTECTIVE CIRCUIT

Klaus Suessmilch, Munich, Germany, assignor to Fritz Schwarzer GmbH, Munich, Germany

Filed Feb. 14, 1974, Ser. No. 442,537
Claims priority, application Germany, Aug. 8, 1973, 2340123
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.1 R **11 Claims**

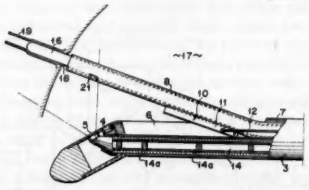


11. Electro-medical patient monitoring equipment comprising circuit means for monitoring certain vital signs of said patient, terminal means for conductively connecting said patient to said circuit means, and overcurrent patient-protective means comprising seriatim: means for sensing current flow in said terminal means, means for converting said current flow to a DC voltage, means for generating a reference voltage, means for comparing said DC voltage with said reference voltage, means for generating a signal when said DC voltage exceeds said reference voltage, means for maintaining said signal for a predetermined period of time, and electromechanical switch means responsive to operation of said signal generating means for interrupting said current flow.

3,886,933
URETERAL CATHETER DEVICE

Toshiyuki Mori, and Kunio Kinoshita, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 10, 1973, Ser. No. 404,992
Int. Cl. A61b *1/30*
U.S. Cl. 128—7 **5 Claims**

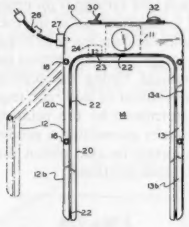


1. A ureteral catheter device comprising a cystoscope including an insert body insertible into the human body, a control body positioned outside the human body, an observation optical system for permitting the interior of a bladder to be observed outside the human body and an illumination optical system for illuminating the interior of the bladder; a flexible guide tube adapted to be inserted through the control body into the cystoscope, the forward end of said flexible guide tube being extendible through said insert body; and a flexible elongated member adapted to be removably inserted through the guide tube and extended through the forward end of the flexible guide tube into the interior of a ureter whereby said guide tube can be further inserted with the elongated member as a guide to permit its forward end to project into the interior of the ureter.

3,886,934
HEAT-MASSAGE DEVICE FOR PHYSICAL THERAPY

Bruce Ivan Doty, 3039 Freeland Rd., Central Point, Oreg. 97501

Filed Mar. 25, 1974, Ser. No. 454,139
Int. Cl. A61h *29/00*
U.S. Cl. 128—24.1 **9 Claims**

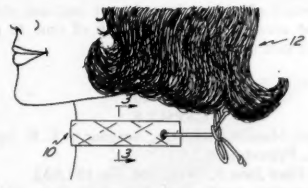


1. A heat-massage device for physical therapy comprising:
a housing,
a pair of articulated gripping arms extending unidirectionally from opposite ends of said housing,
said gripping arms and said housing having substantial width dimensions and defining an open-ended space for receiving a body portion of a person to which said device is applied,
said gripping arms being hinged at their respective connections to said housing and at elbows intermediate their lengths to provide hinged inner and outer arm portions for wrapping said arms about said body portion,
heating pad means lining the body-contacting inner surfaces of said arms and housing,
and vibrator means carried within said housing.

3,886,935
NECKBAND APPLICATOR

Mary Sprague, 302 Moorsgate, Andalusia, Pa. 19020

Filed Apr. 1, 1974, Ser. No. 456,973
Int. Cl. A61h *15/00*
U.S. Cl. 128—57 **7 Claims**



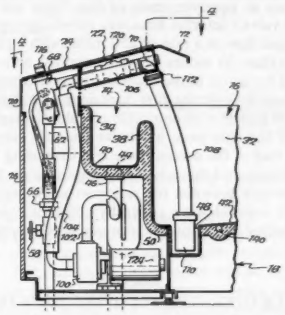
1. A neckband for applying creams or medicaments to the neck of a person, comprising: a tubular material of a predetermined length and a flexible cross section; and means for connecting the ends of the tubular material to enable said tubular material to be maintained in contact with the neck of the person enabling a rolling massaging movement of the neckband while applying a medicament or cream to the neck of the person when worn.

3,886,936
HYDROTHERAPY UNIT

Jon W. Wehrenberg, Rt. 394 Poland Center, Kennedy, N.Y. 14747

Filed Sept. 28, 1973, Ser. No. 401,616
Int. Cl. A61h *9/00*
U.S. Cl. 128—66 **13 Claims**

1. A hydrotherapy unit for performing a patient treating operation comprising in combination:
an upwardly open immersion section characterized as being bounded by non-apertured bottom and upstanding wall portions and sized to at least partially receive a patient therewithin during said patient treating operation;
fresh water supply means isolated from said immersion section for directing fresh water downwardly thereinto;
a drain section separated from said immersion section by one of said upstanding wall portions, said one wall portion

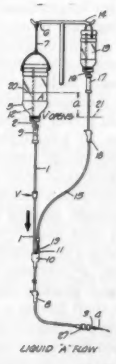


being lower than others of said upstanding wall portions whereby water supplied to said immersion section by said supply means may overflow from said immersion section into said drain section;
drain means for removing overflow water from said drain section; and
additional drain means removably insertable downwardly into said immersion section for withdrawing water therefrom at the completion of said patient treating operation.

3,886,937
MEDICAL ADMINISTRATION SET FOR DISPENSING PLURAL MEDICAL LIQUIDS

Donald E. Bobo, Canoga Park, and Charles J. McPhee, Sylmar, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Continuation of Ser. No. 114,946, Feb. 2, 1971, abandoned. This application May 7, 1973, Ser. No. 357,677
Int. Cl. A61m *05/14*
U.S. Cl. 128—214 R **4 Claims**



1. In a system for administering two liquids which includes an administration tube with an upper liquid receiving end, a lower dispensing end, a drip housing between the administration tube ends, a side port below the drip housing, and the system has a secondary tube with an upper liquid receiving

end and a lower end connected to the side port of the administration tube, the improvement which comprises:

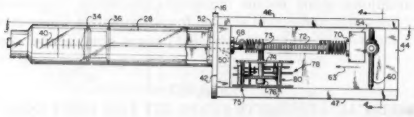
A first non-pressurized liquid container having liquid therein and connected to the upper end of the administration tube; a second non-pressurized liquid container having liquid therein and connected to an upper end of the second tube; a valve in the administration tube between the drip housing and side port, which valve has a movable internal structure that is normally closed when liquid pressure at opposite ends of the valve are equal, but which valve's internal structure moves to open a passage for liquid flow at a rate of 250 ml/hr with a pressure drop of less than 20 inches of water applied across the valve caused by liquid in the second container dropping below the liquid level in the first container by a distance of less than 20 inches; a puncturable resealable diaphragm closing off the side port; a tubular cannula connected to a lower end of the second tube and extending through the diaphragm; and there is a flow regulator on the administration tube between the side port and lower dispensing end for maintaining a generally constant liquid flow rate from either of the two non-pressurized containers.

3,886,938

POWER OPERATED FLUID INFUSION DEVICE

Anthony W. Szabo, Livingston, N.J., and Louis R. M. Del Guercio, Larchmont, N.Y., assignors to Anthony Scala, Livingston, N.J., a part interest

Filed Oct. 23, 1973, Ser. No. 408,264
Int. Cl. A61m *5/20*
U.S. Cl. 128—218 A **2 Claims**



1. Portable, automatic fluid infusion apparatus for administering a predetermined amount of fluid at a predetermined rate over an extended time period, the device comprising

an elongate housing attachable to a user;

a syringe mounted at one end of said housing in axial alignment therewith said syringe comprising an elongated container having an orifice through one end thereof and a piston mounted for longitudinal movement within said container for forcing fluid through the said orifice;

a mechanical power means coupled to and in axial alignment with said piston for longitudinally moving said piston, said power means including rack means;

a mechanical timing mechanism mounted on said housing and coupled to said power means for permitting only a predetermined rate of longitudinal movement of said piston by said power means, thereby providing a predetermined flow of said fluid from said syringe, said mechanical timing mechanism including a main spring, an escapement mechanism, gearing mechanism connected to and rotated by said main spring, said escapement mechanism permitting a controlled rate of rotation of said gearing mechanism, a rotatable main shaft extending outwardly from said gearing mechanism and rotated thereby, said main shaft having a pinion mounted at the outwardly extending end thereof and in engagement with said rack means, and means for winding said main spring;

a first centering means transversely rigidly mounted on said rack means for bearing against opposite sides of said housing during the longitudinal movement of said rack means for maintaining the axial alignment of said rack means and said piston in a first, transverse plane;

a second centering means transversely, rigidly mounted on said rack means perpendicular to said first centering means for bearing against at least one further side of said housing, other than said opposite sides, during the longitudinal movement of said rack means for maintaining the axial alignment of said rack means and said piston in a second, transverse plane, said second transverse plane being perpendicular to said first transverse plane; and

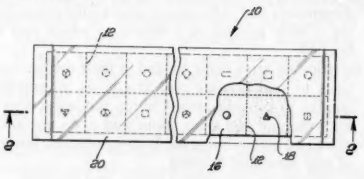
a helical spring attached at a first end to the end of said housing at which said syringe is mounted and attached at the other end to said first centering means for longitudinally urging said rack means into engagement with said piston for the longitudinal movement thereof, said pinion of said mechanical timing mechanism restraining the longitudinal movement of said rack means to a predetermined rate determined by the rotational speed of said pinion, and thereby permitting a predetermined amount of fluid to be forced by said piston through said orifice during a predetermined time.

3,886,939

DEVICE FOR ALLEVIATING MUSCULAR DISCOMFORT

Steve Boxer, 1438 Benedict Canyon Dr., Beverly Hills, Calif. 94710

Filed Sept. 4, 1973, Ser. No. 394,118
Int. Cl. A61f *7/02*
U.S. Cl. 128—268 **8 Claims**



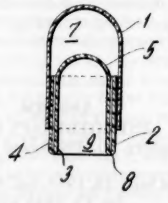
1. A process for alleviating muscular discomfort by placing on the affected skin area a plurality of individual devices comprising a longitudinally flat base material having a medicated adhesive layer thereon throughout its length, each of said adhesive layers having at least one rigid object of a shape so as to not easily penetrate the skin affixed thereto, applying pressure to said device to seat said rigid objects and said layers firmly in contact with said skin area, and maintaining said pressure contact of said medicated layer and said objects to said affected area for a suitable length of time to provide alleviation of said muscular discomfort.

3,886,940

CAPSULE

Gerd Hunger, Munich, Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed June 8, 1971, Ser. No. 151,032
Claims priority, application Germany, July 10, 1970, 2034336; July 10, 1970, 7026065
Int. Cl. A61m *31/00*
U.S. Cl. 128—271 **7 Claims**



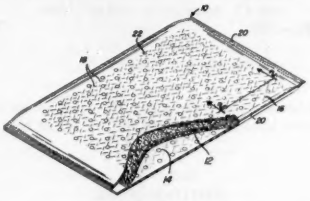
1. A two piece capsule comprising a first tubular half open at one end and a second tubular half open at one end, the side

wall of said second half being folded over externally on itself at the open end, the second half fitting telescopically, closed end forward, into said first half and forming a chamber between the closed ends of said halves.

3,886,941
DIAPER INSERT

John J. Duane, White Plains, N.Y., and Charles B. Lindner, Darien, Conn., assignors to Union Carbide Corporation, New York, N.Y.

Filed June 18, 1974, Ser. No. 480,522
Int. Cl. A41b *13/02*
U.S. Cl. 128—287 **11 Claims**

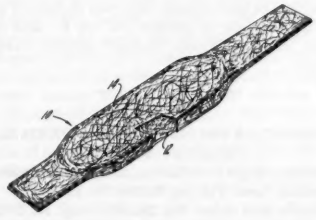


1. A diaper insert which comprises, in combination, at least one absorbent pad disposed between a liquid impermeable hydrophobic topsheet and a liquid impermeable hydrophobic bottom sheet, each of said sheets having a plurality of valvular openings therein, said valvular openings being substantially closable to retard back flow of liquid absorbed by said absorbent pad through said valvular openings, and a system of dimples disposed on each of said topsheet and bottom sheet, said dimples having a frequency of at least one per square inch of absorbent pad area.

3,886,942
SANITARY NAPKIN

Leo J. Bernardin, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 15,164, Feb. 27, 1970, abandoned.
This application Apr. 29, 1974, Ser. No. 464,970
Int. Cl. A61f *13/16*
U.S. Cl. 128—290 **6 Claims**



1. A sanitary napkin comprising an inner core of absorbent material having a shape and size adaptable to absorb body menstrual fluids and a cover enclosing said inner core, said cover, in the body contacting area thereof, consisting of a nonwoven, porous and dry formed web having a basis weight of about 0.25 – 1 oz.lyd.^{2}, said web consisting of unfinished polyolefin or polyester fibers, said unfinished fibers being characterized by fiber surfaces which are devoid of lubricants, antistatic, or wetting agents, said web being intermittently autogenously bonded at discrete bond areas occupying about 5–50% of the web area and disposed in a density of about 50–3200/inch^2 to permit the passage of menstrual fluid therethrough and into the absorbent core under the body pressures of normal usage to provide a substantially dry surface feel to the wearer.

3,886,943
SURGICAL INSTRUMENT

Aphrodite P. Skiff, 5 Darley Rd., Plainview, N.Y. 11803, and John C. Rauth, 22 Winkle Point Dr., Eaton's Neck, N.Y. 11768

Filed Aug. 10, 1973, Ser. No. 387,494
Int. Cl. A61b *17/32, 17/22*
U.S. Cl. 128—305 **9 Claims**

1. A surgical instrument for removing plaque from blood vessels comprising

a handle having a long tubular member

an arcuate blade member describing an arc of less than half a circle connected to said long tubular member and having an outer surface of larger radius and an inner surface of smaller radius, said smaller radius being substantially larger than the diameter of said tubular member, including

a distal non-cutting section having a rounded outer edge

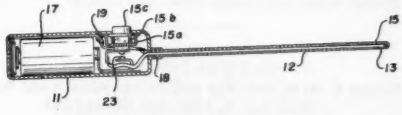
a proximal non-cutting section

a midsection having a cutting edge positioned longitudinally between said distal and proximal sections, said cutting edge being positioned at a radius which does not exceed the radius of the outer surface.

3,886,944
MICROCAUTERY DEVICE

Khosrow Jamshidi, 610 Winston Court, Minneapolis, Minn. 55118

Filed Nov. 19, 1973, Ser. No. 416,760
Int. Cl. A61b *17/36;* **A61h** *3/06*
U.S. Cl. 128—303.1 **4 Claims**



1. Means for cauterizing elongated and unnatural openings of small diameter formed in a body with a small diameter biopsy needle stylet and comprising:

a. gripping handle means having an elongated hollow tubular metallic shaft of small diameter stainless steel extending from one end thereof;

b. said tubular metallic shaft consisting of a tubular shaft portion having a generally cylindrical tip portion with a closed hemispherical tip at the end thereof, said closed tip portion being disposed at the distal end of said tubular shaft portion opposite said handle means, said tubular shaft portion having a certain first electrical conductivity, and said tip portion having an electrical conductivity which is significantly less than that of said tubular shaft portion;

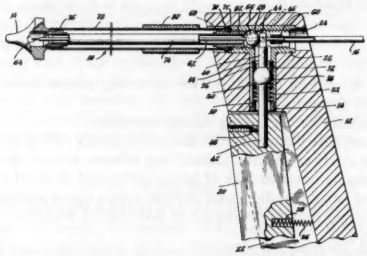
c. an electrical conductor disposed within the confines of said tubular metallic shaft and being arranged generally coaxially therewithin, means for coupling said electrical conductor and said tubular shaft portion to opposite poles of a source of electrical energy, said electrical conductor extending from said handle means to the inner surface of said closed tip end of said tubular metallic shaft and having a layer of electrical insulation disposed generally coaxially therearound, and being secured electrically to

the inner wall of said closed tip portion adjacent the distal end thereof.

3,886,945
CRYOSURGICAL APPARATUS

Joseph G. Stumpf, Fairfield, and Joseph F. Andera, Trumbull, both of Conn., assignors to Frigitronics of Conn., Inc., Shelton, Conn.

Continuation-in-part of Ser. No. 262,543, June 14, 1972, Pat. No. 3,807,403. This application Nov. 7, 1973, Ser. No. 413,684
Int. Cl. A61b *17/36;* **B05b** *1/00*
U.S. Cl. 128—303.1 **10 Claims**

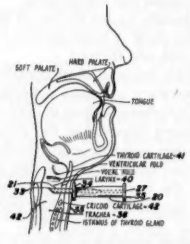


1. A gas operated cryosurgical instrument which comprises: a handle defining a socket therein; a movable first valve member in said handle; a tubular exhaust conduit terminating at one end in a hollow tip of high thermal conductivity, the other end defining a second valve member and including means detachably securing said exhaust conduit seated within said socket; a gas delivery conduit mounted in said handle and extending through said socket and through said exhaust conduit when so secured and terminating at a nozzle within said tip; means for selectively advancing said first valve member against said second valve member to close said exhaust conduit when said exhaust conduit is fully seated within said socket; and means for limiting the movement of said first valve member to prevent closure of said exhaust conduit when the conduit is not fully seated within said socket.

3,886,946
TRACHEA INSTRUMENT

Vernon E. Hyde, P.O. Box 285, Pebble Beach, Calif. 93953

Filed Nov. 9, 1973, Ser. No. 411,181
Int. Cl. A61b *17/24;* **A61m** *16/00*
U.S. Cl. 128—305 **4 Claims**

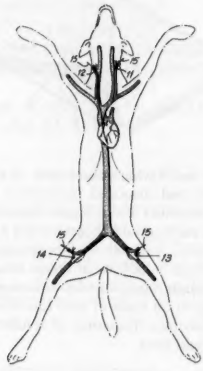


1. A tracheotomy instrument for non-professional emergency use providing air passage to the lungs of a victim to avoid asphyxiation comprising a straight tubular knife in the form of a right circular cylinder having an outer end and a cutting end, said cutting end being slanted to provide an oval opening sharpened into a continuous cutting edge with a rounded point and a handle of greater diameter than said tubular knife immovably secured to the outer end of said tubular knife with a uniform axial passage continuously through said knife and said handle, said handle having a radially outwardly extending stop limiting penetration of said cutting end to entry of the oval opening into the trachea without scraping or penetration of the posterior wall of the trachea upon insertion at right angles to the vertical axis of the trachea.

3,886,947
NON-THROMBOGENIC CATHETER

Philip N. Sawyer, Brooklyn, N.Y., assignor to Meadox Medicals, Inc., Oakland, N.J.

Filed Apr. 13, 1973, Ser. No. 351,051
Int. Cl. A61b *5/02;* **A61m** *25/00*
U.S. Cl. 128—348 **7 Claims**



1. A catheter suitable for introduction of monitoring devices and of solutions of foods, drugs and contrast media into veins and arteries, and having no more than negligible tendency to deposit thrombus or cause thrombosis, thrombophlebitis, periphlebitis or fibrosis, comprising a tubular structure suitable for insertion into a natural or artificial opening in a body, said tubular structure including an outer surface consisting of an acidic copolymer partially neutralized with sodium or potassium so that on intravascular insertion of said catheter the outer surface of said catheter becomes negatively charged as the result of release of positive Na^+ or K^+ ions into the environment, said negatively charged surface being non-thrombogenic.

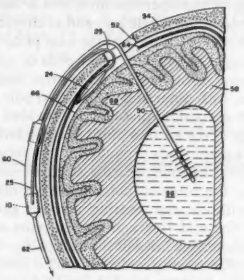
3,886,948
VENTRICULAR SHUNT HAVING A VARIABLE PRESSURE VALVE

Salomon Hakim, Bogota, Colombia, assignor to Hakim Company Limited, Saint Vincent, British W. Indies

Continuation-in-part of Ser. No. 280,451, Aug. 14, 1972. This application Jan. 30, 1974, Ser. No. 437,767
Int. Cl. A61m *27/00*
U.S. Cl. 128—350 V **8 Claims**

1. A cerebral-spinal fluid shunt system comprising:
a conduit for venting fluid from a patient's cerebral-spinal fluid system;
a conduit for draining cerebral-spinal fluid into a selected drainage site within the patient's body;
means for sensing the force exerted by the brain in the dural region;
a one-way bypass valve connecting said vent conduit and said drain conduit, said bypass valve including biasing means for maintaining a pressure differential between said vent conduit and said drain conduit; and

means interconnected with said biasing means responsive to said sensing means for adjusting the biasing of said bypass

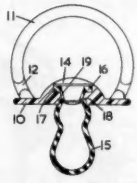


valve as a function of the sensed force thereby to maintain said force substantially at the desired level.

3,886,949
BABY SOOTHER

Eric Kenneth Hurst, London, and Ronald Keith Moore, Kempsey, both of England, assignors to Lewis Woolf Griptight Limited, Birmingham, England

Filed Dec. 12, 1973, Ser. No. 426,678
Claims priority, application United Kingdom, Dec. 14, 1972, 57798/72
Int. Cl. A61j *17/00*
U.S. Cl. 128—360 **3 Claims**

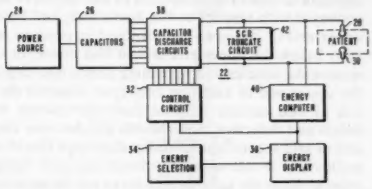


1. A baby soother having a shield with two sides, a resilient teat on one side and a handle on the other side, comprising an integral shield and handle structure, said handle being substantially arcuate in shape, the arcuate shaped handle having ends integral with said other side of said shield, said ends being joined to said shield at positions diametrically opposite to each other, said handle being substantially circular in corossection throughout most of its arcuate shape but having narrow neck portions adjacent each end but spaced from said other side of said shield to form integral resilient hinge means, said neck portion having a degree of resilience to cause the handle to normally stand up on said shield but permitting it to be hinged on the shield by the baby, said shield having a centrally disposed enlarged boss, said boss having a stepped bore therethrough extending from one side to the other, said bore having shoulders therein with the shoulders being disposed in the bore at the respective opposite sides of the shield, said resilient teat being hollow and having beads surrounding an open end thereof, said beads being adapted to interfit with said shoulders to hold said teat projecting from said one side of the shield, a double headed plug fitted into the open end of the teat situated in said bore, the head at one end of said plug being smooth and said plug having a shape fitting within and filling said bore, and said plug engaging the beads on the open end of the teat to hold them interfitted with said shoulders while the head on the other end of said plug holds the plug in place.

3,886,950
DEFIBRILLATOR

Donald C. Ukkestad, Newbury Park; Donald C. Hancock, Thousand Oaks, and Donley J. Valiquette, Camarillo, all of Calif., assignors to Spacelabs, Inc., Chatsworth, Calif.

Filed Oct. 1, 1973, Ser. No. 402,401
Int. Cl. A61n *1/36*
U.S. Cl. 128—419 D **12 Claims**



1. A defibrillator for delivering electrical current to a plurality of patient electrodes comprising:

a plurality of electrodes;

a plurality of capacitors coupled to the electrodes;

means coupled to the capacitors and including a power source for charging the capacitors;

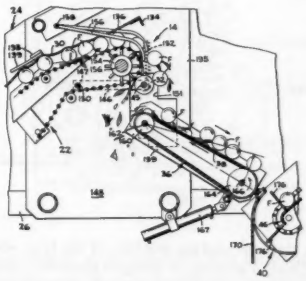
means coupled to the capacitors for initiating discharge of at least one of the capacitors to initiate generation of a current pulse; and

means coupled to the capacitors and responsive to the initiating of discharge of at least one of the capacitors for subsequently discharging at least one other capacitor during the discharge of said at least one of the capacitors to continue the generation of the current pulse.

3,886,951
TRASH SEPARATOR

Leon R. McRobert, 611 Spring St., Ocoee, Fla. 32761

Division of Ser. No. 247,146, April 22, 1972, Pat. No. 3,828,534. This application Aug. 6, 1973, Ser. No. 386,140
Int. Cl. A01d
U.S. Cl. 130—30 R **2 Claims**



1. A trash separator for rollable articles, comprising an upwardly driven, upwardly inclined bar conveyor having spaced rods thereon for supporting rollable articles, debris and defective articles which resist rolling;

a stationary, flexible draper lying above, parallel to and adjacent to the upper run of said first conveyor in position to engage the upper surfaces of the articles to cause the articles to roll up said first conveyor and dislodge the fine debris clinging to the articles, with the fine debris being allowed to fall between the bars of said first conveyor to the ground below;

means for anchoring one end of the draper to said first conveyor;

force applying means bearing against said draper from above and being movable to allow the articles to roll upwardly therepast, while precluding movement of the articles in a generally downward direction;

a second conveyor comprising an upwardly driven, upwardly inclined imperforate roughened belt conveyor having its upper run moving upwardly in a direction opposite to that of the direction of movement of said first conveyor with respect to the horizontal, and having the upper end of its upper run disposed in position immediately below the upper end of said first conveyor so as to receive the articles and remaining debris discharged from the upper end of said first conveyor, wherein the upper run of said second inclined conveyor carries the fine debris and defective, non-rollable articles over the upper end of said second conveyor for discharge therefrom, the inclination of said second inclined conveyor being sufficient to allow the rollable articles to roll down and off the lower end of said inclined conveyor, whereby said second inclined conveyor is so arranged that the debris and defective articles discharged from said second inclined conveyor fall under said first conveyor in the same general area where falls the fine debris dislodged by and through said first conveyor;

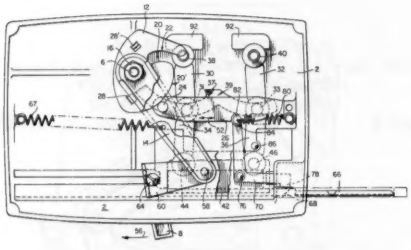
a third conveyor comprising an upwardly driven, upwardly inclined conveyor having the lower end of its upper run disposed in position immediately below the lower end of said second inclined conveyor so as to receive the rollable articles discharged from said second inclined conveyor and having its upper run moving in the same direction as that of the upper run of said first conveyor with respect to the horizontal, wherein said third inclined conveyor carries the rollable articles to a collection point.

3,886,952

CIGARETTE MAKING MACHINE

Arnold Kastner, 10220 Armand Lavergne, Montreal North, Quebec, Canada

Filed Feb. 13, 1974, Ser. No. 441,956
Int. Cl. A24c *5/42*
U.S. Cl. 131—70 **6 Claims**



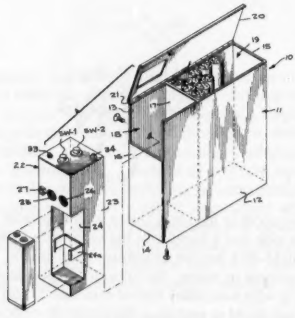
1. A cigarette making machine of the type wherein a compacted wad of tobacco of elongate generally cylindrical shape is injected into a cigarette paper tube, comprising a casing and a hollow nipple secured to the casing to receive an open end of a cigarette tube, a tobacco compacting chamber formed within the casing and an opening in the casing providing access to the chamber, and a tobacco compacting member movable in the chamber to tobacco receiving and tobacco compacting positions, and toggle links means consisting of a toggle arm, and first and second pairs of toggle links for moving the tobacco compacting member, and a movable plunger and attached injection spoon for moving a wad of tobacco from the chamber through the nipple and inject the wad into the cigarette tube, and an operator arm for moving the plunger and spoon, and a cigarette tube retaining lever pivotable under spring action to retain the cigarette tube on the nipple during injection thereinto of a wad of tobacco, and a handle secured to a cam plate having cam surfaces, rotational movement of the handle resulting in rotation of the cam plate and movement of the operator arm, and a cam stud carried adjacent one end of the toggle arm and in contact with the said cam surfaces wherein rotation of the cam plate imparts movement to the toggle link means, inner ends of said two pairs of toggle links being pivotally secured to pivot studs provided on the toggle arm, with outer ends of the first pair of toggle links being pivotally carried by pivot studs provided on the casing, and outer ends of the second pair of toggle links being pivotally secured to pivot studs provided on the tobacco compacting member, and circular bearing surfaces provided on the casing and on the tobacco compacting member for sliding engagement with circular bearing surfaces provided on the outer ends of the said first and second pairs of toggle links, inner ends of the toggle links of the first pair in sliding engagement with circular bearing surfaces molded integrally with and adjacent inner ends of the toggle links of the second pair, and circular bearing surfaces provided on inner ends of the toggle links of the first and second pairs in sliding engagement with circular bearing surfaces provided on and adjacent inner ends of the toggle links of the second and first pairs respectively, the circular bearing surfaces bearing reactive forces resulting from compacting of tobacco into a wad.

3,886,953

ELECTRONIC SMOKING INHIBITING DEVICE

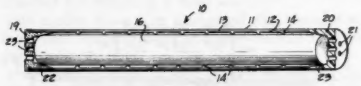
John W. Pope, P.O. Drawer 45246, Dallas, Tex. 75235

Filed May 9, 1974, Ser. No. 468,380
Int. Cl. A24f *15/06*
U.S. Cl. 131—170 A **22 Claims**



1. Apparatus for inhibiting cigarette smoking, comprising a cigarette case having a cigarette storage compartment, a moveable lid normally closing said compartment and moveable to an open position permitting access to the compartment for removal of a cigarette, releasable latch means for releasing said lid to move to open position responsive to actuation of a lid opening actuator; smoking inhibiting means carried by the case administering faradic shock punishment to a user person operating the case under predetermined conditions comprising first delay means for delaying release of the lid for a predetermined pre-opening delay period following actuation of the latch means, second electrical delay means for producing a shock initiating signal a predetermined post-opening delay period following opening of said lid, an electrical faradic shock generator for producing a faradic shock electrical signal responsive to said initiating signal, and an electrically conductive shock applying device to be conductively connected to said shock generator and to be supported in contact with the skin of the user for applying the faradic shock signal to the user to produce the shock punishment.

3,886,954
FIRE SAFETY CIGARETTE
Johannes Hermanus Hannema, and Lena Touw Nio Hannema, both of 547 Dolores, Apt. 5, San Francisco, Calif. 94110
Filed Mar. 13, 1974, Ser. No. 450,744
Int. Cl. A24d *1/11*
U.S. Cl. 131—175 **9 Claims**



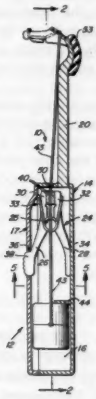
6. A method of encapsulating a cylinder of tobacco to define a disposable encapsulated cigarette comprising:
forming a double-walled tubular housing having an inner and an outer wall defining an annular space between said walls;
forming at least the inner wall of a non-flammable material;
supporting a cylinder of tobacco on a plurality of protrusions disposed on the inner surface of the inner wall;
permanently capping said housing at each end thereof by permanently securing to each end an identical end cap provided with a plurality of air passages therethrough and with sealing means for preventing ingress of air from the interior of the housing to said air passages.

3,886,955
CIGARETTE AND THE LIKE FILTER AND METHOD FOR PRODUCING SAME
James W. Johnson, 17526 Brush St., and Gladys Janet Knapp, 300 Whitmore, both of Detroit, Mich. 48203
Filed Nov. 16, 1973, Ser. No. 416,457
Int. Cl. A24f *7/04*
U.S. Cl. 131—261 R **13 Claims**

1. A process for producing an absorptive filter material having good drawing properties for cigarettes and the like smoking articles comprising:
a. providing a quantity of human hair,
b. depositing said hair in an aqueous solution of sodium bicarbonate,
c. boiling said hair-containing solution for a sufficient time so that further boiling of said hair in a fresh sodium bicarbonate solution produces no discoloration of said fresh solution,
d. separating said hair from said solution,
e. drying said hair so that a residue of sodium bicarbonate remains thereon, and
f. packing the thus treated hair into a filter receptacle for use with said smoking article.

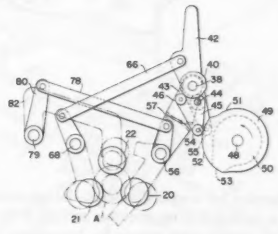
3,886,956
DENTAL FLOSS HOLDER
Walter A. Cash, P.O. Box 160, Missoula, Mont. 59801
Filed Dec. 7, 1973, Ser. No. 422,781
Int. Cl. A61c *15/00*
U.S. Cl. 132—91 **5 Claims**

1. A dental floss holder, comprising, in combination:
a. a support, the support including a housing having a cavity, a cover selectively enclosing the cavity, and a supply means for furnishing floss;
b. head means connected to the support for holding floss in position to clean between teeth;
c. gripping means for selectively retaining floss held by the head means, the gripping means being arranged in the cavity, and the gripping means arranged between the supply means and head means along a path of floss passing from the supply means to the head means, the gripping means including a pincer having a pair of elements pivotally connected together and arranged forming a pair of cooperating handles and a pair of cooperating jaws, and a spring biasing the jaws toward one another and gripping floss passing therebetween, resilient pieces mounted on the jaws for facilitating gripping of the floss, one of the handles being arranged abutting a wall of the



housing and the other of the handles arranged in an opening provided in the housing and the other of the handles arranged in an opening provided in the housing for selective movement toward the one of the handles for opening the jaws and releasing the floss.

3,886,957
COIN PACKAGING APPARATUS
Masatoshi Ushio, Himeji, Japan, assignor to Glory Kogyo Kabushiki Kaisha, Hyogo, Japan
Filed Jan. 3, 1974, Ser. No. 430,516
Claims priority, application Japan, Jan. 12, 1973, 48-6420
Int. Cl. G07d *9/00*
U.S. Cl. 133—1 A **5 Claims**



1. In a coin packaging apparatus of the type including coin stacking means for arranging a predetermined number of coins of the same diameter into a neat stack, a plurality of wrapping rolls including at least one movable roll, said rolls arranged annularly in parallel spaced relationship to each other, means operatively positioned for directing the stack of coins to a wrapping position between said wrapping rolls, means operatively coupled to said wrapping rolls for imparting rotation to at least some of said wrapping rolls and hence to the stack of coins held therebetween, and means operatively positioned for supplying a wrapper to be wound around the stack of coins as said coin stack rotates together with said wrapping rolls, the improvements comprising:
transferring means operatively coupled to said movable wrapping roll for moving the movable wrapping roll toward the other wrapping rolls from a predetermined

position irrespective of the diameter of coins to be wrapped and prior to movement of the stack of coins to the wrapping position thereof;

stopping means operatively positioned for stopping the movement of said movable wrapping roll at a position corresponding to the diameter of the stack of coins and spaced by a distance from the periphery of said stack of coins, said stop being made prior to wrapping operation and in the midst of the movement of said movable wrapping roll;

releasing means operatively coupled for releasing said stop means for continuing movement of the movable wrapping roll until said movable roll is brought into contact with the periphery of the coin stack to be wrapped; and

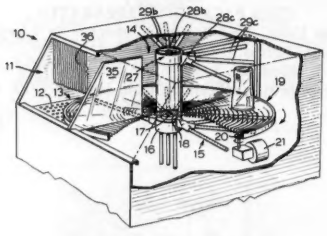
restoring means operatively coupled to said movable wrapping roll for restoring said movable wrapping roll to said predetermined position irrespective of the diameter of coins after the wrapper is supplied to the wrapping position and is wound around the coin stack by the plurality of wrapping rolls.

3,886,958

APPARATUS FOR WASHING ARTICLES

Howard Diebel, Village of Jordan Station, Ontario, and Albert Deman, Village of Vinemount, Ontario, both of Canada, assignors to Moyer Diebel Limited, Jordan Station, Ontario, Canada

Filed Aug. 29, 1973, Ser. No. 392,719
Int. Cl. B08b *3/02*
U.S. Cl. 134—80 **3 Claims**



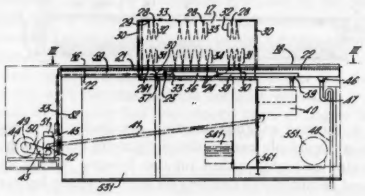
1. Apparatus for washing articles, the apparatus comprising a frame, a central bearing member mounted by the frame and adapted to receive pipe means for conveying liquids thereto, a rotary conveyor mounted by the bearing member for rotation about a vertical axis to convey the articles mounted thereon through a pre-rinse station, a wash station and a rinse station each of which extends over a sector of the conveyor of predetermined angular extent, motor means operatively connected with the conveyor to rotate it at a predetermined speed, a set of radially-extending spray pipes for each of the said stations extending from the said central bearing member over a sector of angular extent corresponding to that of the respective station, being detachably connected to the central bearing member by a single common detachable mechanical pipe connection having a respective axis that extends radially from the said vertical axis and receiving a respective liquid from said pipe means, each of said detachable mechanical pipe connections between each set of spray pipes and the bearing member being mechanically non-interchangeable to ensure connection of each set of spray pipes only to operate in the respective station.

3,886,959

GLASS WASHING MACHINE

Reginald W. Stott, 4021 Farrington St., Burnaby, British Columbia, Canada

Filed May 14, 1973, Ser. No. 360,009
Claims priority, application Canada, May 18, 1972, 142481
Int. Cl. B08b *3/02*
U.S. Cl. 134—134 **12 Claims**



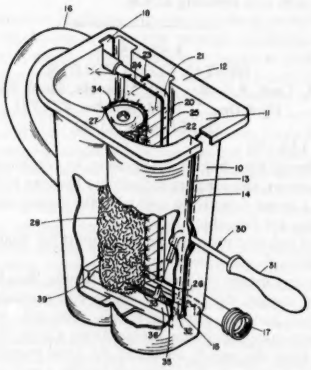
1. An improved washing machine comprising: a conveyor table having a loading station provided with infeed driven roller conveyor means and a take-off station provided with outfeed driven roller conveyor means; a washing station intermediate said loading station and said take-off station of said conveyor table, said washing station including transversely extending driven roller conveyors, a plurality of transversely extending lower hollow tubes, disposed between selected ones of said driven roller conveyors and dispersed along the length of the conveyor, each lower tube being provided with a plurality of upwardly directed spray nozzles, for directing spray vertically upwardly substantially perpendicular to said lower hollow tubes, the upper level of each such hollow tube being coincident with the upper level of the conveyor rollers, and an upper hood, said upper hood including a plurality of upper, hollow transversely extending tubes disposed vertically above said lower hollow tubes, each said upper hollow tube being provided with downwardly directed nozzles, for directing a spray of wash water vertically downwardly substantially perpendicularly to said upper hollow tubes.

3,886,960

PAINT ROLLER CLEANING APPARATUS

Ralph A. Krueger, 820 Appalachee Ave., Winter Park, Fla. 32789

Filed Oct. 23, 1973, Ser. No. 408,723
Int. Cl. B08b *3/02*
U.S. Cl. 134—138 **10 Claims**



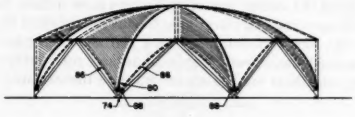
1. A paint roller cleaner comprising in combination:

a. a hollow casing open at both ends and adapted to receive a paint roller;
b. an enlongated channel located in said casing and having a plurality of openings therein facing the interior of said casing for spraying the length of a paint roller in said hollow casing;
c. fluid channel connection means located exterior said hollow casing and connected to said elongated (pipe) channel for attaching a fluid source;
d. said casing having an elongated slot therein extending from said opening along one side thereof for receiving a paint roller handle;
e. a bottom portion of said casing having an elongated grooved track for receiving a portion of a paint roller handle to hold and guide said paint roller during cleaning thereof whereby sliding said handle in said groove provides additional coverage of fluid sprayed on said roller from said fluid channel;
f. drain means for allowing the escape of fluid from said (casing) groove whereby a paint roller handle guides the roller while it is being cleaned in said hollow casing without removal from the handle.

3,886,961
PRESTRESSED MEMBRANE STRUCTURE

David H. Geiger, 788 Riverside Dr., New York, N.Y. 10032, and Horst Berger, 18 Chestnut Dr., Hastings on Hudson, N.Y. 10706

Division of Ser. No. 234,238, March 13, 1972, Pat. No. 3,807,421. This application Oct. 26, 1973, Ser. No. 409,779
Int. Cl. E04b *1/347*; **A43f** *1/00*
U.S. Cl. 135—1 R **12 Claims**



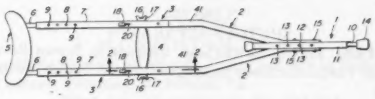
1. A building structure including a plurality of flexible arches, a flexible membrane operatively connected to said arches in a folded configuration having ridges and valleys therebetween with said flexible arches being located at said ridges, and a plurality of prestressed flexible cables respectively located in the valleys formed in the membrane between two adjacent arches to hold said membrane in tension against said arches, whereby said arches are braced against buckling by said membrane to form a relatively rigid structure; said arches being formed of normally flat flexible members arranged to extend radially with respect to each other, to define a generally circular dome structure; and said structure including means for maintaining said flexible members in an arched configuration; said prestressed cables holding said membrane against said flexible arches upon downward flexing of said arches and said flexible arches holding said membrane against said prestressed cables during upward movement of said arches whereby said membrane is held in tension against said arches under substantially all load conditions to brace said arches against buckling.

3,886,962
FOLDING CRUTCH

Damon Diamontis, 520 Mt. Auburn St., Watertown, Mass. 02172

Filed June 20, 1973, Ser. No. 371,722
Int. Cl. A61h *3/02*
U.S. Cl. 135—49 **3 Claims**

1. In a crutch, first and second arm portions, means connecting said arm portions in fixed parallel relationship, first and second leg portions, means connecting said leg portions in fixed parallel relationship, first telescoping joint means connecting said first arm portion to said first leg portion for movement between a first position and a second position, second telescoping joint means connecting said second arm portion to said second leg portion for movement between a first position and a second position, said joint means comprising means for fixing said leg portions in parallel coplanar relationship to said arm portions in said first position, and allowing said leg portions to be swung into overlapping and non-coplanar relationships to said arm portions in said second position, first latch means operably connected to said first telescoping joint means, second latch means operably connected to said second telescoping joint means, said latch means each being operable to a first stable position in which

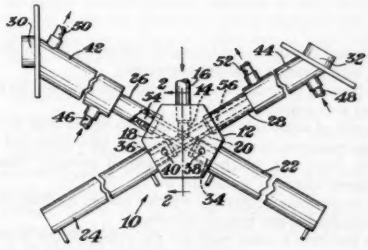


its associated joint means is locked in said first position, said latch means each being operable to a second stable position in which said telescoping joint means may be moved to their second positions when and only when both of said latch means is in said second position, each of said latch means comprising manually operable means movable between first and second positions, locking means movable between locking and unlocking positions, and resilient means for urging said locking means toward said locking position, said resilient means comprising detent means engaged by said manually operable means in said second position of said manually operable means for moving said locking means to said unlocking position.

3,886,963
VALVE

Elvis E. Jones; William A. Mays, and William F. Smith, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 10, 1973, Ser. No. 404,960
Int. Cl. B29f *1/05*
U.S. Cl. 137—334 **3 Claims**



1. A valve assembly for directing a moldable material into a mold cavity, the assembly including the combination of:
a valve body;
a first flow bore and second flow bore which extend through the valve body, which intersect with each other within the valve body, which are positioned transverse to each other within the valve body, which communicate with a first and second mold cavity, and wherein each bore is adapted for carrying moldable material into the first and second mold cavities;
an inlet bore which extends into the valve body, which communicates with the first and second flow bores, and which is adapted to carry a moldable material into the first and second flow bores;

a first plunger rod which fits slidably within the first flow bore, and which will extend, in advance position, beyond the point at which the inlet bore communicates with the first flow bore;

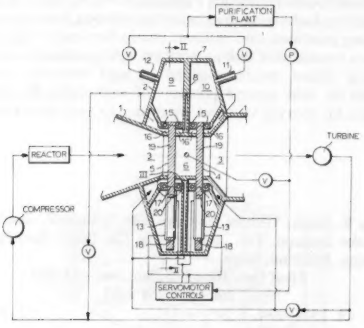
a second plunger rod which fits slidably within the second flow bore and which will extend, in advance position, beyond the point at which the inlet bore communicates with the second flow bore;

means connected to the first and second plunger rods for independently advancing and retracting the said rods within the first and second flow bores, to thereby alternately direct the moldable material into the first or second mold cavity.

3,886,964
SHUTOFF APPARATUS

Klaus Uhlig, Zurich, Switzerland, assignor to Brown Boveri-Sulzer Turbomaschinen Aktiengesellschaft, Zurich, Switzerland

Filed Nov. 12, 1973, Ser. No. 415,130
Claims priority, application Switzerland, Nov. 17, 1972, 16762
Int. Cl. F16k *49/00*
U.S. Cl. 137—340 **9 Claims**



1. Shutoff apparatus for a conduit conveying a high temperature, high pressure medium comprising

a. a housing including a duct for said medium and an external wall spaced therefrom;

b. a pair of adjustable gates in the housing movable between two positions in which, respectively, they close and open the duct, and which, in the closed position, bound a barrier chamber within the duct;

c. a supply passage through which a barrier medium may be delivered to the barrier chamber;

d. a partition located between the planes of the gates and extending between the duct and the external wall to thereby divide the intervening space into two sub-chambers;

e. a discharge passage for leading medium out of each sub-chamber;

f. actuating means situated wholly within the housing and serving to move the gates between said two positions;

g. sealing elements reacting between the housing and the gates and effective to inhibit leakage of medium along and from the duct in said closed position and to inhibit leakage of medium from the duct in said open position;

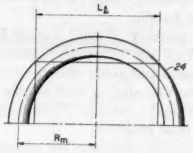
h. cooling chambers interposed between the sealing elements and the duct and bounded in part by portions of the gates in both of said open and closed positions; and

i. cooling passage means through which a cooling medium may be passed through the cooling chambers.

3,886,965
LINKAGE GEOMETRY FOR A SLURRY SYSTEM

James H. Tarter, Royal Oak, Mich., and David L. McCain, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 298,691, Oct. 18, 1972, abandoned. This application Oct. 10, 1973, Ser. No. 404,946
Int. Cl. F16l *25/00, 11/04*
U.S. Cl. 137—355.16 **6 Claims**

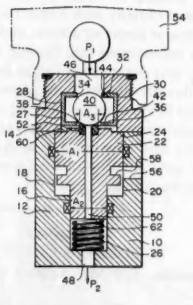


1. In a system comprising a longitudinally movable flexible tubular slurry hose means having an axis and a plurality of spaced movable support means, said movable support means being adapted to support said flexible tubular slurry hose means above the surface of the earth and said flexible tubular slurry hose and movable support means being coactive with arcuate turn guides to move therearound while maintaining equal effective length of said flexible tubular slurry hose, and a means for interconnecting said movable support means, said means for interconnecting said movable support means comprising long and short linkage means alternately pivotally connected together between each of said movable support means along the center line of said slurry hose means, means for rigidly securing said slurry hose means to said short linkage means, and means maintaining each pivotal connection uniformly spaced transversely from said arcuate turn guide when said long and short linkage means traverse therearound.

3,886,966
HYDRAULIC PRESSURE CONTROL UNIT

Keiichiro Yabuta, and Yoshitaka Koike, both of Yokohama, Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Dec. 17, 1973, Ser. No. 425,128
Claims priority, application Japan, Dec. 18, 1972, 47-12672
Int. Cl. F16k *45/00*
U.S. Cl. 137—493.2 **3 Claims**



1. A hydraulic pressure control unit adapted to be connected between a source of fluid under pressure and a hydraulic actuator, comprising:

a housing having an inlet for connecting to the source and an outlet for connection to the actuator;

a valve spool movable within a longitudinal bore in said housing between a first position at which fluid communication between the inlet and the outlet is blocked, and a second position at which fluid communication between the inlet and outlet is allowed;

said valve spool defining therethrough an axial bore and having a large end thereof communicating with the inlet and a small end thereof communicating with the outlet;

a valve seat fixed to a portion of said large end of said valve spool and surrounding said axial bore;

biasing means to urge said valve spool toward said first position; and

a valve element adapted to engage with said valve seat and thereby block fluid communication between the inlet and the outlet through said axial bore unless said valve spool has been moved from said first position to said second position;

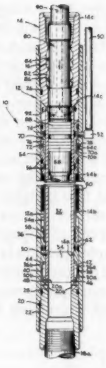
fluid from the source being able to move said valve spool from said first to said second position and thereby flow through said axial bore to the outlet only if its pressure is above a predetermined value.

3,886,967

DOWNHOLE SAFETY BALL VALVE

Norman A. Nelson, Houston, Tex., assignor to FMC Corporation, San Jose, Calif.

Filed Sept. 24, 1973, Ser. No. 400,082
Int. Cl. E21b *33/00*
U.S. Cl. 137—495 **7 Claims**



1. A downhole safety valve assembly for controlling the flow of well fluids, said assembly comprising

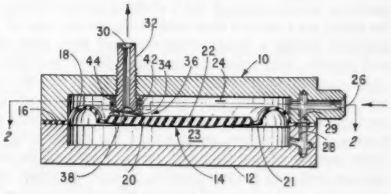
1. a tubular housing element,
2. an inner concentric fluid-conducting sleeve element secured to and spaced from the housing element, said sleeve element forming a well fluid flow passage through said valve assembly,
3. a ball valve for controlling flow through said flow passage,
4. a control piston slidable in the annular space between said housing and sleeve elements and having ball valve operating means at its lower end portion,
5. spring means in said space and extending between said housing element and said control piston for urging said control piston to its valve closed position,
6. a floating piston in said space and above said control piston,
7. control piston retainer means slidably mounted between said pistons,
8. means cooperable with said retainer means for facilitating releasable retention of said control piston in its valve opening position by said retainer means,
9. a port in said housing for supplying fluid under pressure directly to the upper end of said control piston for opening said ball valve,
10. a port in said sleeve element for supplying fluid under pressure directly from the flow passage to the upper end of said floating piston for moving said control piston to its valve opening position via said retainer means, said retainer means thereupon releasably retaining said control piston in its valve opening position, and
11. means on said floating piston for holding said retainer means in its control piston retaining condition.

3,886,968

FLOW CONTROL DEVICE

Donald K. Murrell, La Mirada, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Apr. 22, 1974, Ser. No. 463,015
Int. Cl. G05d *7/01*
U.S. Cl. 137—501 **12 Claims**



1. A flow control device comprising

a casing having inlet means and outlet means;

control valve means disposed in said casing for controlling flow between said inlet means and said outlet means;

diaphragm means including a flexible outer portion and a thickened central portion mounted in said casing, the flexible outer and thickened central portions being movable to operate said control valve means, said diaphragm means having first and second sides on the flexible outer and thickened central portions defining first and second chambers, respectively, in said casing, said outlet means being disposed in said casing in off centered relation to said thickened central portion, said first chamber communicating with said inlet means, said second chamber communicating with said outlet means, and said thickened central portion on said second side of said diaphragm means having an off centered portion disposed adjacent said flexible outer portion and said outlet means to be exposed to outlet pressure;

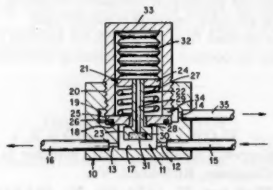
said control valve means including a valve member carried on said off centered portion adjacent said outlet means; and

means for establishing communication between said first and second chambers such that the area of said second side of said diaphragm means with the exception of said off centered portion adjacent said outlet means is exposed to inlet pressure and the area of said first side of said diaphragm means in exposed to inlet pressure whereby a force differential exists across said diaphragm means to move said diaphragm means to tend to close said control valve means when inlet pressure increases or outlet pressure decreases and to tend to open said control valve means when inlet pressure decreases or outlet pressure increases.

3,886,969
TIME DELAY VENT VALVE

Michael L. Shira, Castro Valley, and Robert H. Henderson, Livermore, both of Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 23, 1973, Ser. No. 365,299
Int. Cl. F16k *31/12*
U.S. Cl. 137—509 **12 Claims**



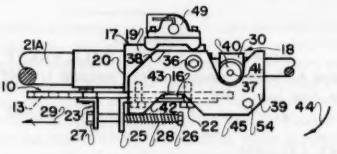
1. A time delay valve comprising: a housing defining a chamber therein, said housing comprising a first body portion and a second body portion interconnected by mating threaded sections of said first and second body portions, a piston-like member positioned in said chamber and having spaced end portions interconnected by a shank portion having a cross-sectional area smaller than said end portions, one of said end portions having a larger cross-sectional area than the other end portion, said housing being provided with a fluid inlet in open communication with a lower portion of said chamber, and with an exhaust port in communication with a central portion of said chamber, said central portion of said chamber having a cross-section greater than the cross-section of said lower portion of said chamber, means intermediate said lower portion and said central portion of said chamber defining a valve seat, said other end portion of said piston-like member being positioned to cooperate with said valve seat defining means such that a fluid seal is provided therebetween preventing fluid flow between said lower portion and said central portion of said chamber, means located in an upper portion of said chamber having a cross-section less than said central portion of said chamber and defining a pressure accumulator in fluid communication with said one end portion of said piston-like member, said lower, central, and upper portions of said chamber being in axial alignment with one another, said piston-like member being provided with a channel extending therethrough providing fluid communication between said lower portion of said chamber and said pressure accumulator means, and means forming a fluid flow restrictor and functioning as a time delay positioned in said channel, said fluid flow restriction forming means comprising a porous member positioned in an enlarged section of said channel such that a portion of the fluid flowing from said inlet into said lower portion of said chamber passes through said porous member into said pressure accumulator means thereby acting on the larger cross-sectional area of said one end portion of said piston-like member forcing said other end portion thereof away from said valve seat defining means and allowing fluid to pass from said lower portion to said central portion of said chamber and exhaust through said exhaust port.

3,886,970
FLUID PRESSURE CONNECTOR AND BREAK-AWAY UNIT

Percy Barlow, 444 4th St., Weyburn, Saskatchewan, and Roderick Bruce Barlow, 96 Rupert Dr., Saskatoon, Saskatchewan, both of Canada (S7K1B3)

Filed Mar. 29, 1973, Ser. No. 345,953
Int. Cl. F16l *37/12, 37/22, 37/28*
U.S. Cl. 137—561 R **8 Claims**

7. In a fluid coupling assembly for detachably connecting a first coupler portion to a second coupler portion and which includes a source of fluid pressure, a reservoir, an operating valve, and hydraulic lock means between said operating valve and said first coupler portion; the improvement consisting of support means, said first coupler portion being mounted upon said support means for limited endwise movement thereon, spring means reacting between said support means and said first coupler portion normally biassing said first coupler portion in a direction away from said second coupler portion, means on said first coupler portion for detachably locking said second coupler portion into engagement with said first coupler portion, said means including means for unlocking said second coupler portion from said first coupler portion when a pull is exerted between said portions greater than the strength of said spring means, and means for releasing fluid pressure within said first coupler portion to facilitate connection of said second coupler portion to said first coupler portion, said coupling assembly including a pair of fluid pressure lines connected to said first coupler portion, said last mentioned means including a valve assembly operatively connected between said fluid pressure lines and means to operate said valve means to connect said lines to said reservoir, and means to mount said first coupler portion upon said support means, said last mentioned means including an elongated slot formed through said support means and bolt means engaging through said slot and into said first coupler portion, said means for detachably locking said second coupler portion into engagement with said first coupler portion including a piar of side plates pivotally mounted one upon each side of said first coupler portion, a projection extending upon each side of said second coupler portion and a recess in each of said side plates engageable by said projections when said second coupler portion is connected to said first coupler portion, and means co-operating between said support means and said side plates for pivoting said side plates out of engagement with said projections when said first coupler portion is moved in the opposite direction of said second coupler portion upon said support means against pressure of said spring means, each projection including a cylindrical boss journalled for rotation to said second coupler portion.



3,886,971
APPARATUS FOR REGULATING THE RATIO OF MIXING OF TWO FLUID FLOWS

Jorgen Schjerning Lundsgaard, Bontvedvej 29, 5700, and Hans Peter Degn, Karlskilde, 5633, Knarreborg, both of Denmark

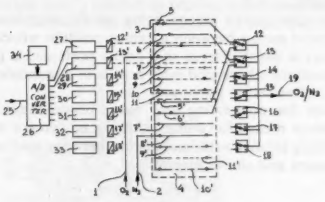
Filed Mar. 20, 1973, Ser. No. 343,134
Claims priority, application Denmark, Mar. 20, 1972, 1297/72
Int. Cl. B01f *5/00*
U.S. Cl. 137—599 **4 Claims**

1. An apparatus for regulating the ratio of mixing two fluids from separate fluid supplies while maintaining a constant overall flow rate of the fluids, the apparatus comprising:

two identical sets of parallel connected flow resistors, the ratios of the fluid conductivities of said resistors of each set being in accordance with a binary system;

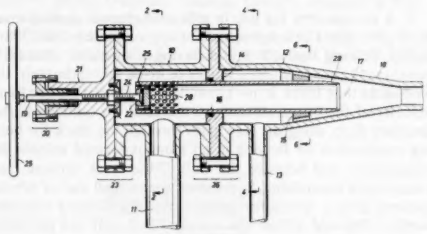
valve means including a plurality of two-way valves for connecting said resistors into the flow path of a respective fluid, the inlets of each of said sets being connected to a respective fluid supply and the outlets of said flow resis-

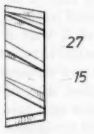
tors of said sets having the identical fluid conductivity being connected to inlets of a respective said two-way valve such that only one flow resistor of each conductivity



valve is connected at a time for enabling flow in its respective flow path, and the outlets of said two-way valves being interconnected for combining the fluids into a single flow path.

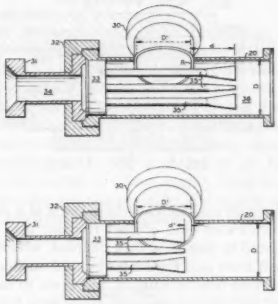
3,886,972
CORE FLOW NOZZLE
Paul R. Scott, Houston, Tex.; Victor J. Chavez, New Orleans, La., and Vitold R. Kruka, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.
Filed Dec. 6, 1973, Ser. No. 422,249
Int. Cl. F17d *1/16;* **F16k** *19/00*
U.S. Cl. 137—602 **10 Claims**





1. A nozzle for establishing core flow of a viscous fluid inside an annulus of a low viscosity fluid comprising a tubular body having two chambers, the first chamber having an inlet for a viscous fluid and the second chamber having an inlet for a low viscosity fluid, the second chamber having a conical taper at one end disposed away from the first chamber, a tubular member axially aligned within the two chambers, one end of the tubular member being located within the first chamber and being open to admit viscous fluid thereinto, the other end of said tubular member being disposed adjacent the conical taper of said second chamber and being axially movable within said chamber to control the velocity of low viscosity fluid, means for axially moving the tubular member within the two chambers, and a flow director within the second chamber to further align the tubular member therewithin, the flow director comprising flow directing louvers disposed at an angle to impart a swirling action to the low viscosity fluid.

3,886,973
PRODUCTION OF A VARIEGATED PRODUCT
Alfred W. Kinney, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed July 9, 1973, Ser. No. 377,449
Int. Cl. F16k *19/00*
U.S. Cl. 137—604 **27 Claims**



7. Apparatus for injecting a stream of generally liquid material into a stream of generally plastic material comprising:

tee means having a generally straight tubular chamber with substantially uniform diameter D and length of at least 2D with an upstream inlet and a downstream outlet, said tee means also having an intermediate inlet downstream of said upstream inlet, the downstream edge of said intermediate inlet being located a distance of at least D upstream from said downstream outlet, said intermediate inlet having a diameter at least substantially equal to D, said intermediate inlet being operably connected to a plastic material supply means so as to permit the flow of plastic material through said intermediate inlet to said chamber; a liquid material supply means operatively secured to said upstream inlet; and

at least one ribbon tube having an upstream end and a flattened downstream end forming a downstream ribbon tube opening with a cross section of substantially greater length than width, each said ribbon tube being operably connected at its upstream end to said upstream inlet so as to provide a flow of liquid material through said ribbon tube into said mixing chamber.

3,886,974
VALVE
Curt Arnold Bjorklund, Box 99, Ulricehamn, Sweden
Filed Feb. 22, 1973, Ser. No. 334,559
Claims priority, application Austria, Mar. 3, 1972, 1826/72; Sweden, Nov. 27, 1972, 15402/72
Int. Cl. F16k *23/00*
U.S. Cl. 137—613 **2 Claims**

1. A valve device for a fluid line comprising in combination:

a. a valve chamber,

b. a fluid inlet to said valve chamber, a fluid outlet from said valve chamber that is spaced away from said fluid inlet, and a fluid flow channel connecting said fluid inlet and fluid outlet,

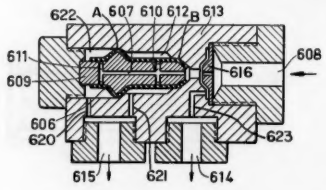
c. a variable pressure chamber located intermediate said fluid inlet and fluid outlet resp. associated to said outlet,

d. an expandable member disposed across said variable pressure chamber, said expandable member being adapted to be moved from one position to another within said fluid pressure chamber in response to fluid force applied to its surface,

e. a first passageway connecting one side of said expandable member with said fluid flow channel at a point intermediate its ends,

f. a second passageway connecting the other side of said expandable member with said fluid flow outlet at a point beyond the outlet end of said fluid flow channel,

g. a resilient disc positioned between said fluid inlet and the beginning of said fluid flow channel, said resilient disc being provided with a centrally located hole, and



h. a fluid return passageway which starts at a point between the downstream side of said resilient disc and the upstream end of said fluid flow channel, which passageway is cut off from said fluid inlet by said resilient disc under normal fluid flow conditions and open to said fluid flow channel and inlet at pressure conditions below said normal fluid flow pressure conditions.

3,886,975

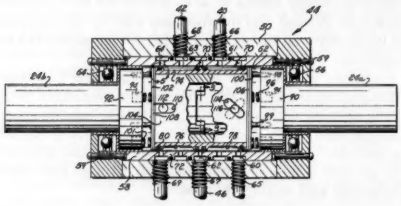
VALVE ASSEMBLY

John J. Kristof, and Geza A. Thiry, both of Marion, Ohio, assignors to Sycon Corporation, Marion, Ohio

Division of Ser. No. 150,433, June 7, 1971, Pat. No. 3,763,957. This application July 23, 1973, Ser. No. 382,285

Int. Cl. F16k *11/02*

U.S. Cl. 137—625.42 **8 Claims**



1. A valve comprising,

a valve housing having an axially extending chamber formed therein,

an inlet and a plurality of outlet ports in said housing communicating with said chamber,

rotatable shaft means extending into said chamber,

said shaft means including a rotatable input shaft having an end portion disposed in said chamber and a rotatable output shaft having an end portion disposed in said chamber,

lost motion coupling means for interconnecting said input and output shafts and for enabling limited relative rotation to occur between said input and output shafts,

sleeve means disposed in a telescopic relationship with said end portions of said input and output shafts,

means for effecting rotation of said sleeve means with said input shaft upon rotation of said input shaft,

means cooperating with said sleeve means and said shaft means to shift said sleeve means axially of said shaft means upon relative rotation between said input and output shafts,

valve piston means disposed in said chamber on said sleeve means for directing fluid flow between said inlet and outlet ports,

said sleeve means being rotatable relative to said valve piston means and said housing upon rotation of said input shaft,

said valve piston means being axially shiftable with said sleeve means between a center position where said inlet port is isolated from said outlet ports and a plurality of positions where said inlet port is in communication with selected outlet ports, and

means for connecting said valve piston means and said sleeve means for unitary shifting movement and for enabling relative rotation to occur between said valve piston means and sleeve means.

3,886,976

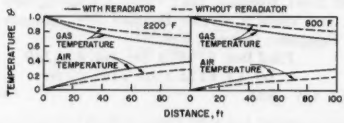
RECUPERATOR HAVING A RERADIANT INSERT

Alan Kardas, Chicago; Dennis H. Larson, Bridgeview, and John D. Nesbitt, Chicago, all of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Oct. 25, 1973, Ser. No. 409,399

Int. Cl. F15d *1/02*

U.S. Cl. 138—38 **2 Claims**



1. A recuperator for use in a heat-exchange stack furnace having hot gases at temperatures of approximately 2000°F and higher flowing through it and having a diameter exceeding approximately 5 feet and a height of up to approximately 100 feet such that there is no capability of increasing the mass velocity of the hot gases through the stack by taking a higher pressure drop along the flow path through the stack for heating combustion air flowing in an annulus formed outside the recuperator and between the wall of the stack furnace, said recuperator comprising, in combination: a shell wall of tubular construction; a reradiator in the form of a floating extended surface disposed within said tubular shell wall and providing an additional area accepting heat by convection and radiation from said hot gases flowing through said shell wall, said heat being retransmitted to said shell wall by continuous-spectrum radiation, whereby the rate of transfer of heat from said hot gases across the shell wall to the combustion air flowing in the annulus outside the shell wall is enhanced, said reradiator being a cylindrical, coaxial reradiator which separates the flow of said hot gases into two streams whose temperatures differ depending on the relative sizes of the diameters of said cylindrical coaxial reradiator and said shell wall, the diameter of said cylindrical coaxial reradiator being proportioned to balance the temperatures of said two streams.

3,886,977

PLUG FOR PIPES UNDER PRESSURE

Gerard Dorgebray, La Chaussee, d'Ivry, France (28260)

Filed July 27, 1973, Ser. No. 383,107

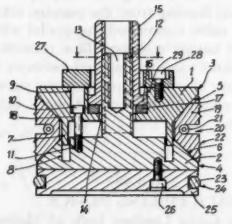
Claims priority, application France, Aug. 4, 1972, 72.28206

Int. Cl. F16l *55/12*

U.S. Cl. 138—89 **5 Claims**

1. Plug for pipe under pressure which comprises two coaxial end plates which are mounted for relative translation, each having a peripheral frusto-conical surface facing the other and having the same taper, a plurality of jaws consisting of a number of circumferentially spaced sectors of a ring having a cylindrical circumferential surface, the diameter of which surface approximates the inner diameter of the pipe to be plugged, said sectors occupying the space between the two

frusto-conical surfaces of the end plates, means for retaining said sectors in said space, sealing means mounted on one of the end plates and constituting with said one end plate a closure completely blocking said pipe, a threaded spigot fixed to one of the plates and passing through the other, the end of said spigot being axially tapped to receive a threaded operating rod, a nut screwed onto the outside of said spigot and

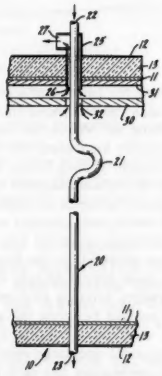


overlapping said other end plate, and at least one elongated connecting means extending between said coaxial end plates, parallel to the axis of said end plates and preventing relative rotation of said end plates, one end of each connecting means being longitudinally slidable within one of said end plates between fixed abutments which limit the axial movement of said end plates relative to each other.

3,886,978
GAS VENT

Ronald G. Deeks, Oakville, Ontario, Canada, assignor to Procor Limited, Lincolnshire, Ill.

Division of Ser. No. 130,423, April 1, 1971, Pat. No. 3,730,200. This application Oct. 5, 1972, Ser. No. 295,321
Int. Cl. F16l *55/00*
U.S. Cl. 138—103 **3 Claims**



1. In a vessel containing hot molten sulphur therein and having a layer of sulphur crust formed on the top surface thereof, an improved apparatus for venting hydrogen sulphide gas from the vessel, comprising:

a. conduit means passing through said sulphur crust for receiving a hot fluid therethrough to melt a hole in said sulphur crust about the outer periphery of said conduit means and permit trapped hydrogen sulphide gas to pass upward therethrough; and

b. vent means concentric with said conduit means having one end in fluid communication with the area above said sulphur crust and the other end in fluid communication with the outside of said vessel for venting hydrogen sulphide gas from said area above said sulphur crust to the outside of said vessel.

3,886,979
SHIRRED TUBULAR FOOD CASINGS HAVING A BARRIER COATING

Jerome J. M. Rasmussen, South Stickney Twp., Marinette County, Ill., assignor to Union Carbide Corporation, New York, N.Y.

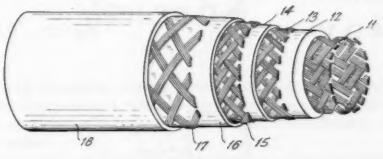
Filed Aug. 1, 1972, Ser. No. 276,919
Int. Cl. A22c *13/00*
U.S. Cl. 138—118.1 **6 Claims**

1. A shirred and compressed length of tubular cellulosic food casing comprising a tubular cellulosic food casing of extended continuous length that is shirred and compressed into a shortened length thereof, said tubular casing provided with a moisture content of at least about 10% and a continuous moisture and gas impermeable barrier coating adhered to at least one surface thereof, said coated casing also provided with an extensibility characteristic measured at 32°F. of at least 4%, said shirred tubular food casing being suitable for use in the processing and storage of food products where loss of moisture therefrom and oxidation thereof is to be prevented.

3,886,980
STEAM HOSE DESIGN

Arthur M. Elson, Hamilton Twsp., Mercer County, N.J., assignor to Acme-Hamilton Manufacturing Corporation, Trenton, N.J.

Filed May 21, 1973, Ser. No. 362,087
Int. Cl. F16l *11/08*
U.S. Cl. 138—127 **7 Claims**



1. For use in coupling a steam generating source to steam operated equipment, a relatively light weight flexible cylindrical shaped hose assembly for conveying steam at pressures in excess of 150 psi said hose assembly comprising:

a seamless lightweight braided inner sleeve;

a first seamless tubular layer of steam resistant resilient material surrounding said inner sleeve;

a second seamless braided intermediate sleeve surrounding said first tubular layer and having braids formed of a plurality of wire strands collectively adapted to withstand the high pressures developed within the bore of the hose assembly and to enhance the ability of the hose assembly to retain its normal cylindrical shape;

a second seamless steam heat resistant tubular cover layer formed of a resilient material and surrounding said intermediate sleeve;

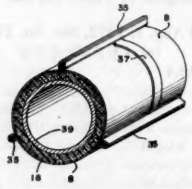
said inner sleeve being affixed to the inner surface of said first seamless tubular layer and defining the inner wall of the hose assembly, said inner sleeve comprising braided strands of steam and heat resistant glass yarn interlaced to form a closed woven sleeve exposed to the steam passing through the bore of the hose assembly for preventing particles which may break away from said first seamless tubular layer from entering into the flow of steam passing through said bore.

3,886,981

PIPELINE INSULATION MEANS

Kay E. Eliason, Fort Madison, Iowa, assignor to Atlantic Richfield Company, Philadelphia, Pa.

Division of Ser. No. 196,630, Nov. 8, 1971, Pat. No. 3,774,281.
This application July 30, 1973, Ser. No. 383,957
Int. Cl. F16l 9/14
U.S. Cl. 138—149 7 Claims



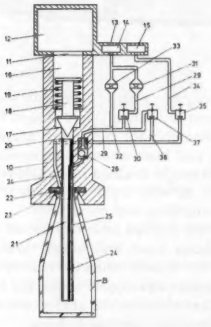
1. An insulated pipeline having a plurality of insulation sections secured against the pipe by longitudinal and circumferential securing means at insulating section joints wherein said longitudinal securing means is a double fold standing rib seam formed by doubly folding pairs of flanges extending radially outward from the longitudinal edges of circumferentially adjacent insulation sections and said circumferential securing means comprises batten straps free of exposed edges.

3,886,982

APPARATUS FOR EFFECTING THE RAPID FILLING OF CONTAINERS WITH LIQUID

Gerhard Uth, and Alfred Rentel, both of Bad Kreuznach, Germany, assignors to Seitz-Werke G.m.b.H., Bad Kreuznach, Germany

Filed July 10, 1973, Ser. No. 378,035
Claims priority, application Germany, July 12, 1972, 2234120
Int. Cl. B65b 31/00
U.S. Cl. 141—39 7 Claims



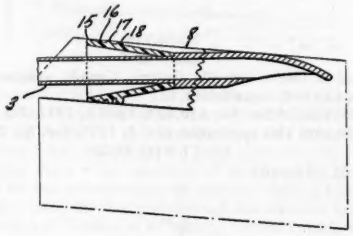
1. An apparatus for filling containers, such as bottles, with liquid and comprising; a filling pipe adapted for insertion into the container from above to dispose the lower end of the pipe near the bottom of the container, a liquid supply chamber, means connecting said supply chamber to the upper end of said pipe, a chamber for gas under pressure, a gas relief chamber, a seal surrounding said pipe and adapted for sealingly engaging the mouth of a container when the pipe is inserted into the container, a first valve connected between said pressure gas chamber and the container side of said seal to communicate the gas pressure chamber with the container when the mouth of the container is engaged by said seal, a gas return passage leading from the lower end of said pipe upwardly and including a lateral opening near the top of the container, a main conduit connecting the upper end of said passage with said relief chamber and having a first flow restrictor therein, a check valve in said main conduit between said passage and said first restrictor, which opens away from said first flow restrictor, said check valve being normally open and closing in response to liquid flowing from the passage into said main conduit, a second valve connected in parallel with said first flow restrictor and having a second flow restrictor in series therewith, and a third valve connected between the side of said first valve which is remote from said gas pressure chamber and said main conduit between said check valve and said first flow restrictor.

3,886,983

SACK-FILLING DEVICE

Zeth Forssen, and Gosta Lindius, both of Malmo, Sweden, assignors to Aktiebolaget Cementa, Malmo, Sweden

Filed June 24, 1971, Ser. No. 156,497
Int. Cl. B65b 1/16, 1/18, 1/28, 3/17, 39/04
U.S. Cl. 141—68 5 Claims

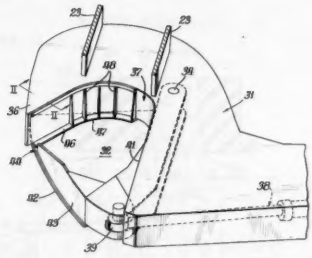


1. A sack-filling device for filling particulate material into sacks provided with a sack valve without entrainment of air in the filled sack, permitting air within the sack to vent while preventing entry of outside air during the filling operation, comprising, in combination, a sack-filling means smaller in external diameter than the inside diameter of the sack valve, defining an annular space between its outside wall and the inside wall of the sack valve, and adapted to extend into the sack valve to feed particulate material into the sack; and a sealing insert of resilient material in the form of a truncated cone attached to the sack-filling means; the sealing insert being provided with ridges running circumferentially about the insert, to improve sealing between the sealing insert and the inside wall of the sack valve, having a wide end and a narrow end and having axial apertures only at the wide and narrow ends, coaxially embracing the sack-filling means and disposed across the annular space between the sack valve and the sack-filling means, sealing engaging in a secured and closed relationship the outside of the sack-filling means at the narrow end, and sealingly engaging in a flexible relationship the inside of the sack valve at the wide end, to substantially close off the annular space, the sack-filling means having a recessed portion on its exterior wall, and the sealing insert at its narrow end sealingly engaging the sack-filling means at the recess, the insert being sufficiently resilient to flex away automatically from the inside wall of the sack valve and open the seal therewith for egress of gas via the annular space from within the sack when under high gas pressure therewithin, or under stress applied to the insert by the sack under the weight of particulate material filled therein.

3,886,984
TREE HARVESTER SHEAR ASSEMBLY WITH FIXED AND MOVABLE BLADES

Henry L. Engel, New Lenox, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 3, 1974, Ser. No. 475,848
Int. Cl. B27c *9/00*
U.S. Cl. 144—3 D **11 Claims**



1. A tree harvester unit for mounting on a vehicle comprising

a shear frame adapted for attachment in generally horizontal and transverse arrangement to a longitudinal axis of the vehicle,

a fixed jaw secured to the shear frame and extending outwardly from the vehicle,

a movable cutting blade pivoted to the shear frame and extending outwardly from the vehicle while in a retracted position to form an opening in combination with the jaw and a portion of the shear frame intermediate the jaw and movable blade for receiving a tree, the movable blade being pivotable toward the jaw and intermediate frame portion to secure the tree within the opening as it is being severed,

motor means interconnected between the movable blade and shear frame,

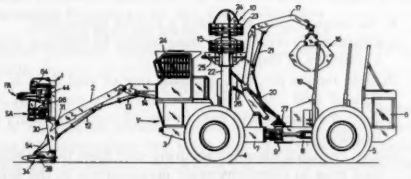
a fixed blade extending along the jaw and intermediate frame portion in facing relation to the movable blade to penetrate the tree as the tree is urged thereagainst by severing movement of the pivoted blade, the fixed blade being slightly offset to permit movement therepast of the pivoted blade, and

guide means extending perpendicularly from the fixed blade to limit penetration of the fixed blade and facilitate movement of the severed tree relative to the fixed blade.

3,886,985
MULTIPLE TREE HARVESTER AND METHOD FOR HARVESTING TREES

Anthony Iarocci, and William John Willows, Both of Brantford, Ontario, Canada, assignors to Koehring Canada Limited, Brantford, Ontario, Canada

Filed Apr. 5, 1974, Ser. No. 458,328
Int. Cl. B27h *1/00*
U.S. Cl. 144—309 AC **19 Claims**

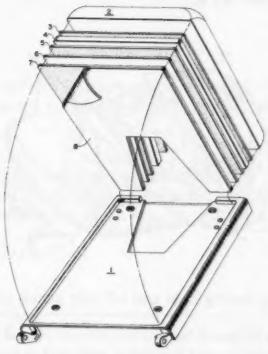


1. A multiple tree harvester for cutting and accumulating trees, one at a time, said harvester having a support frame, a primary pair of arms and a secondary pair of arms movably mounted on said support frame for cooperating to gather a plurality of trees, one at a time, said pairs of arms being vertically spaced on said support and from one another; said pairs of arms being shiftable between an open, tree receiving position and a closed, tree holding position; power means attached to each of said pairs of arms and for selectively moving each of said pairs of arms between their open tree receiving position and their closed, tree holding position, and power operated tree severing means located generally below said arms for severing said trees which are to be accumulated.

3,886,986
LEATHER LAMINATE FOR CAMERA HOUSING

Andrew Renzullo, Nashua, N.H., and George D. Suokko, Plainville, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 24, 1972, Ser. No. 300,157
Int. Cl. B65d *65/14, 65/40*
U.S. Cl. 150—52 J **9 Claims**



1. In a photographic camera which includes a camera housing, the improvement wherein said housing has adhered thereto by means of a layer of pressure-sensitive adhesive, in inverse order:

a leather element having a surface adapted to be exposed to the environment;

a layer of adhesive substantially continuously coated over the surface of the leather element opposed to the surface adapted to be exposed to the environment; and

a metallic component stiffer than said leather element adhesively attached to the coated side of the said leather element.

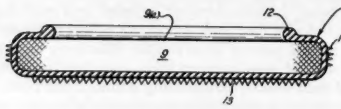
3,886,987
ELASTIC SURFACE EXPOSURE WRAPPER FOR SOAP CAKES

Frederick E. Schuchman, Gateway Towers, Pittsburgh, Pa. 15222

Continuation-in-part of Ser. No. 246,355, April 21, 1972, abandoned. This application Apr. 20, 1973, Ser. No. 353,126
Int. Cl. B65d *65/02*
U.S. Cl. 150—52 **1 Claim**

1. A protective wrapper for soap cakes consisting of a pocket made of thin, elastic, very thin flexible, non self supporting, shapeless water impervious, imperforate sheet material adapted to be snugly stretched over, and to assume the shape of, various sizes of soap cakes; the said pocket having an opening therein of maximum area, when the pocket is unstretched, substantially less than the total unstretched surface area of the pocket sheet material, the surface of said pocket sheet material being continuous and unbroken except

for said opening, the inside surface of said pocket sheet material being substantially smooth, the said outside surface being

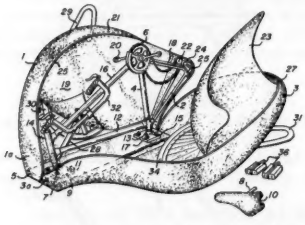


rough, and an elastic bead integral with said sheet bordering said opening.

3,886,988
BICYCLE BAG

Wayne E. Garrett, San Mateo, and John W. McKean, Jr., Woodside, both of Calif., assignors to Jeanne P. Garrett, San Mateo, Calif., a part interest

Filed July 19, 1973, Ser. No. 380,614
Int. Cl. B65b *11/00*
U.S. Cl. 150—52 R **19 Claims**



1. A bag having right and left side panels of flexible fabric material;

a rigid elongated base at the bottom of said bag coupled to said panels; said bag being sufficient in size to receive the partially disassembled components of a bicycle, including two wheels and bicycle frame thereof and said base being of a length slightly greater than the distance between the head tube and the seat tube of said bicycle frame and said bag being of a width to fit a wheel in between each side panel and a bicycle frame in side-by-side arrangement;

coupling means connected to said base for holding said bicycle frame in a predetermined standing position relative to said base so that the center of gravity of said frame remains over said base; and

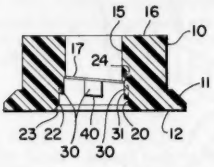
fastening means for joining together said right and left panels to close the bag.

3,886,989
SELF-THREADING NUT

John Strange, Llanishen, Wales, assignor to Firth Cleveland Fastenings Ltd., England

Filed Feb. 11, 1974, Ser. No. 441,526
Claims priority, application United Kingdom, July 17, 1973, 34021/73
Int. Cl. F16b *39/284, 37/00*
U.S. Cl. 151—7 **7 Claims**

1. A self-threading fastener adapted for self-threading engagement with an externally threaded member, said fastener comprising a body having a threaded member receiving bore therethrough, said bore having a plain, smaller diameter portion adjacent one end, an enlarged diameter portion adjacent the other end and a stepped juncture interposed said smaller and enlarged diameter portions, said stepped juncture being defined by a chamfered surface extending radially outwardly in a direction toward said enlarged diameter bore portion, said enlarged diameter bore portion having a plurality of circumferentially spaced, radially inwardly and axially extending thread engaging ribs made of a deformable material which terminate at their innermost ends at the stepped juncture, said ribs having inner radial faces which together define a diameter which is larger than the diameter of said smaller diameter bore portion whereby said ribs are adapted to be progressively engaged by a leading edge of an externally threaded member

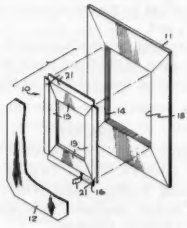


so that relatively small amounts of material are displaced initially from the ribs prior to self-threading engagement of the externally threaded member through the smaller diameter bore portion, the ends of the ribs remote from the smaller diameter bore portion and the stepped juncture both defining a helix of equal angle in respect to the longitudinal axis of the bore.

3,886,990
INTEGRAL UNIVERSAL STRETCHER BAR

Joseph C. Campione, 1156 Wilcox Ave., Monterey Park, Calif. 91745

Filed Apr. 23, 1973, Ser. No. 353,693
Int. Cl. B44d *3/18*
U.S. Cl. 160—374.1 **4 Claims**



1. An assembly for stretching a canvas comprising:

a substantially rectangular base having an opening therein;

a plurality of flaps;

flexible means pivotally securing one of said flaps to each side of said base, said flaps extending outwardly away from the side of said base in spaced complementary relationship thereto;

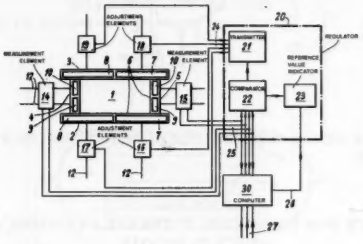
means for (maintaining) securing said flaps to the sides of said base in complementary juxtaposition to the sides of said base, whereby a canvas secured to said flaps is maintained in a taut condition between said flaps and the sides of said base.

3,886,991

METHOD AND APPARATUS FOR CONTROLLING THE WITHDRAWAL OF HEAT IN MOLDS OF CONTINUOUS CASTING INSTALLATIONS

Walter Meier, Winterthur, and Werner Bruderer, Feldmeilen, both of Switzerland, assignors to Concast AG, Zurich, Switzerland

Filed Apr. 16, 1973, Ser. No. 351,772
Claims priority, application Switzerland, Apr. 18, 1972, 5666/72
Int. Cl. B22d *11/02*
U.S. Cl. 164—4 6 Claims



1. A method of controlling the withdrawal of heat from a cast strand by means of a cooling agent during continuous casting of metals, comprising the steps of casting the strand in a continuous casting mold having several cooling regions adjacent one another around the periphery of the mold and constituting several ducts for the cooling agent, measuring the quantity of heat withdrawn at least at given ones of the cooling regions, comparing the withdrawn quantities of heat with reference values for such quantities of heat which are to be withdrawn and which reference values are dependent upon the shape of the mold, to thereby determine contact of the skin of the strand against the walls of the mold, and as a function of the deviations of the withdrawn quantities of heat and the reference values of such quantities of heat which are to be withdrawn determined by the comparison operation controlling the quantity of heat withdrawn at least at one cooling region adjoining a measured region so as to control the contact of the strand skin and mold wall.

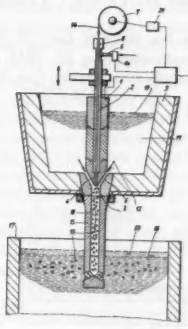
3,886,992

METHOD OF TREATING METAL MELTS WITH A PURGING GAS DURING THE PROCESS OF CONTINUOUS CASTING

Hermann Maas, Bochum; Horst Abratis, Hagen Atw, and Claus Raeune, Hattingen, all of Germany, assignors to Rheinstahl Huettenwerke AG, Essen, Germany

Filed May 26, 1972, Ser. No. 257,421
Claims priority, application Germany, May 28, 1971, 2126606
Int. Cl. B22d *11/10*
U.S. Cl. 164—56 11 Claims

1. A method of treating metal melts during continuous casting for suppressing the formation of undesirable oxidic non-metallic inclusions, comprising the steps of enclosing the teeming metal to a point below the surface of the metal pool in a continuous casting mold to avoid contact with the ambient atmosphere, covering the surface of the pool with a layer of slag, and introducing small volumes of purging gas in bubble form into the metal melt at the location where such metal melt begins to form a teeming jet, so that the injector-like



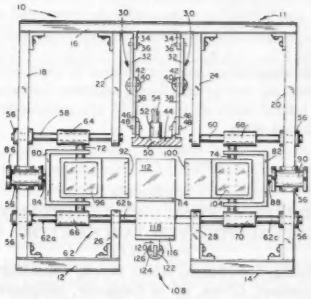
action of the melt divides the gas into a multiplicity of very small bubbles which are carried into the mold by the melt.

3,886,993

SAND MOLDING APPARATUS

Sam Larkin, 254 Beach 140th St., Belle Harbor, N.Y.

Filed May 30, 1973, Ser. No. 365,095
Int. Cl. B22c *15/02*
U.S. Cl. 164—211 12 Claims

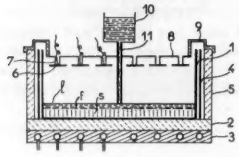


1. Compacting chamber arrangement for sand molding apparatus comprising a pivotally mounted chamber support member movable in an oscillatory manner between two angular positions about an axis; first and second sand mold compacting chambers provided on said chamber support member, said first and second chambers being angularly spaced about the pivotal axis of said chamber support member, and means for oscillatorily moving each of said chambers to a sand filling and sand compacting station of the sand molding apparatus in one angular position of said chamber support member and subsequently to a sand mold ejecting station of the sand molding apparatus in the other angular position of said chamber support member, said first and second chambers each comprising a pair of spaced parallel walls to form a chamber having open sides and an open top, the open sides being adapted to receive the compacting rams of the sand molding apparatus and the open top being adapted to receive sand to be compacted and adapted to be covered by a cover plate of the sand molding apparatus.

3,886,994
DEVICE FOR MAKING A CASTING OF A DIRECTIONALLY SOLIDIFIED ALLOY

Bernard Daigne, Chatillon, and Francois Girard, Paris, both of France, assignors to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.), Chatillon-sous-Bagneux, France

Division of Ser. No. 301,638, Oct. 27, 1972, Pat. No. 3,838,729. This application May 28, 1974, Ser. No. 473,365
Claims priority, application France, Nov. 5, 1971, 71.39703
Int. Cl. B22d *27/02*
U.S. Cl. 164—250 **11 Claims**



1. Device for casting parts and ingots of a metallic alloy with an ordered structure obtained by the progressive solidification of a liquid alloy and comprising a thin walled mould, means for introducing into the mould an alloy with suitable initial composition, means for heating the liquid phase of the alloy introduced into the mould and means for cooling the lower portion of the mould, wherein :

a. the means for introducing the alloy comprise at least one duct and means for maintaining the lower end of the duct at a constant distance from the free surface of the liquid phase,

b. the heating means are constituted by elements radiating the heating energy and facing said free surface,

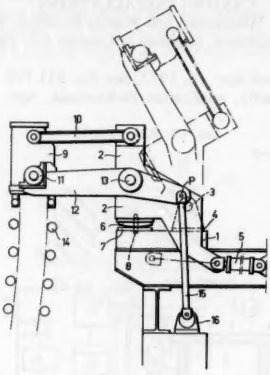
c. the lateral walls of the mould are surrounded by heat insulating walls.

3,886,995
CONTINUOUS CASTING INSTALLATION EQUIPPED WITH MOLD SUPPORT PIVOTABLE OUT OF A CASTING POSITION

George Bollig, Meerbusch; Klaus Brock, Dusseldorf, and Alfred Niendorf, Glehn, all of Germany, assignors to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany

Filed June 7, 1974, Ser. No. 477,183
Claims priority, application Germany, June 9, 1973, 2329561
Int. Cl. B22d *11/04, 27/08*
U.S. Cl. 164—260 **4 Claims**

1. A continuous casting installation comprising a mold support, means for mounting the mold support to be upwardly pivotable about a substantially horizontal pivot axis out of a casting position, a mold guided in the direction of its lengthwise axis at the mold support, a frame, an oscillation drive anchored at said frame, said oscillation drive including a connecting rod, an oscillation lever operatively engaging with the mold, means for pivotably mounting the oscillation lever at the mold support for pivotable movement about a pivot axis, said connecting rod being hingedly connected with the oscillation drive, means providing a hinge connection of the oscillation lever with the connecting rod and arranged in such a manner with respect to the pivot axis of the mold support that during upward rocking of the mold support the pivotal movement of the oscillation lever relative to the mold support, and which pivotal movement is dependent upon the momentary standstill position of the mold within the oscillation

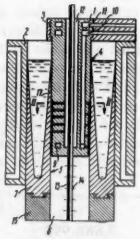


stroke, is located within the range of the oscillation stroke of the mold.

3,886,996
DEVICE FOR PRODUCING INTERNAL CYLINDRICAL SPACE IN INGOTS

Aron Yakovlevich Tseitlin, ulitsa Metallurgov, 41, kv. 42; Oleg Viktorovich Martynov, ulitsa Pervomaiskaya, 2, kv. 31; Jury Nikolaevich Ordinarisev, ulitsa Bunkernaya, 16, kv. 20; Vladimir Nikolaevich Ordinartsev, ulitsa Stoletova, 5, kv. 1; Evgeny Pavlovich Tishkin, ulitsa Michurina, 129, kv. 42; Sergei Sergeevich Tikhonov, ulitsa Metallurgov, 1-a, kv. 6, and Alexeevich Vladimir Belousov, 2 proezd Metallurgov, 6, kv. 96, all of Tula, U.S.S.R.

Filed Mar. 13, 1973, Ser. No. 340,748
Int. Cl. B22d *11/02*
U.S. Cl. 164—283 M **3 Claims**



1. A device for producing cylindrical spaces in ingots on a plant for the continuous casting of metals comprising: a metallic rod-like mandrel having an external surface which is in agreement with the internal space of the ingot being cast; said mandrel having holes disposed circumferentially thereon for the passage of a cooling agent, said holes being in communication with each other; a central bore being disposed inside said mandrel along its axis; means for feeding the cooling agent to the internal space of the ingot being cast in the section located after said mandrel in a direction of movement of the ingot, said feeding means being arranged axially inside said central bore with the formation between said means for feeding the cooling agent to the internal space of the ingot being cast and the internal surface of said bore of a clearance serving for discharging gas-water emulsion that is formed in the course of cooling of the ingot being cast; said mandrel having longitudinal slots disposed on its external surface in its section along its

length where the strength of a metal skin formed on the internal surface of the ingot being cast precludes its sagging into said longitudinal slots which serve for drawing through the gas-water emulsion forming when the cooling agent is fed into the internal space of the ingot being cast after said mandrel to provide a more intense and uniform cooling of the internal space of the ingot; each of said longitudinal slots being connected with said central bore through a port.

3,886,997

METHOD OF OPERATING A HEAT EXCHANGER

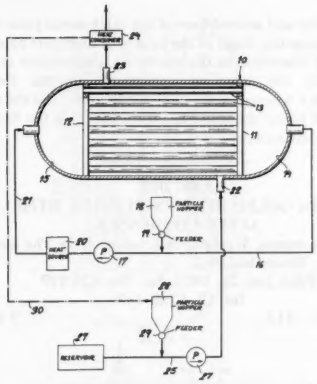
Ludolf Plass, Kronberg, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 9, 1973, Ser. No. 404,680

Claims priority, application Germany, Oct. 6, 1972, 22489914

Int. Cl. F28d *13/00*

U.S. Cl. 165—1 **6 Claims**



1. In a method of operating a heat exchanger wherein a liquid heat-exchange fluid is passed in contact with a heat exchanger surface, the improvement which comprises suspending in said fluid particulate solids physically and chemically inert to said liquid heat-exchange fluid with an average particle size of 10 to 150 microns in an amount of 0.5 to 20% by volume and such that the suspension has a Reynolds number of 10,000 to 70,000 at the average velocity of the liquid heat-exchange fluid in contact with said surface based on a flow channel of a diameter of 1 centimeter.

3,886,998

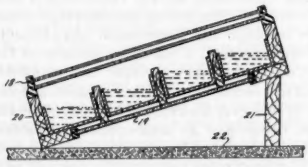
COMBINATION SOLAR WATER HEATER AND CHILLER

Richard J. Rowekamp, 3626 Glenmore Ave., Cincinnati, Ohio 45211

Filed Sept. 6, 1973, Ser. No. 394,789

Int. Cl. F25b *13/00*

U.S. Cl. 165—2 **9 Claims**



2. A method for heating and cooling a group of buildings comprising, in combination, alternately by season, adding and removing a few materials from a basic structure so that by interchanging materials two different solar phenomina result, one which chills water by exposing it to cool night air, the other heating water by exposing it to sunlight, enclosing a large number of said interchangeable structures within a fenced area, periodically filling and draining said structures after water has been heated or chilled to a satisfactory temperature, storing said heated or chilled water, pumping said heated or chilled water into a radiator and blowing air through it into a duct system so as to heat or cool all the rooms of the buildings, storing the de-energized water, chilling said water by using an interchangeable solar structure comprised basically of a bank of narrow and shallow and uncovered containers, modifying said solar structure seasonally and alternately by applying a transparent panel to the top and an insulating cover to the bottom so as to seal it tight and prevent heat losses while exposing water to sunlight, said pumping of water and blowing of air being accomplished periodically by automatically controlling their flow by using control devices and related equipment.

3,886,999

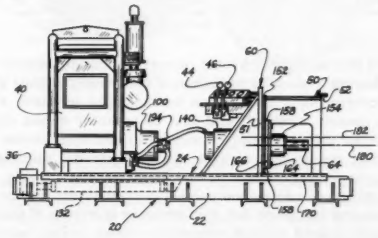
PORTABLE EARTH BORING MACHINE

William S. Appleman, Ashland, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 20, 1974, Ser. No. 471,439

Int. Cl. E21b *3/02*

U.S. Cl. 173—159 **4 Claims**



1. A portable earth boring machine comprising, in combination, track means; frame means mounted for movement along said track means; an engine; pump means driven by said engine; thrust plate means mounted on said frame means forwardly of said engine and pump, said thrust plate means including a vertically disposed slot; fluid motor means in circuit with said pump means and mounted on said thrust plate means for vertical movement between upper and lower fluid motor positions, said fluid motor including an auger drive shaft extended through said slot; a lower casing pusher ring mounting means on said thrust plate means for mounting a smaller pusher ring concentric with said auger drive shaft in said lower position; and an upper casing pusher ring mounting means on said thrust plate means for mounting a larger pusher ring concentric with said auger drive shaft in said upper position.

3,887,000

CONTROL SYSTEM COMPRISING DIFFERENTIAL AMPLIFIER WITH DUAL CURRENT COMPARATOR HAVING TWO OUTPUTS SEPARATED BY A DEADBAND

Hubert B. Pinckaers, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 295,398, Oct. 5, 1972. This application Feb. 25, 1974, Ser. No. 445,405

Int. Cl. F25h *29/00*

U.S. Cl. 165—26 **3 Claims**

1. In a temperature control system an improved dual output differential amplifier and current comparator circuit for selectively providing an electrical output at either of a first or a

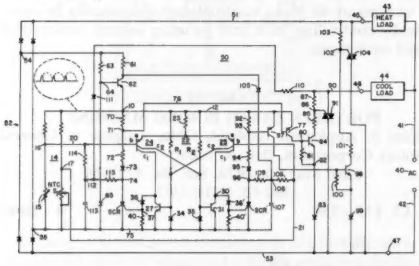
second output terminal in response to a signal where said first and second output terminals are connected to control heating load means and cooling load means comprising:

first solid state current control means having a control electrode, an input electrode and first and second current source electrodes;

second solid state current control means having a control electrode, an input electrode and first and second current source electrodes;

conductive means including impedance means connecting said input electrodes together and to a first energizing terminal;

circuit means for connecting said control electrodes to a control signal such that said first and second current control means are normally conductive and in which said control signal is a temperature responsive impedance network;



first and second solid state current comparator means each having a plurality of terminals comprising at least a first control input terminal, a second input terminal, and a common terminal, said first comparator means second input terminal being connected to said first current control means first current source electrode, said second comparator means second input terminal being connected to said second current control means first current source electrode and, said common terminals of said first and second current comparator means being connected to a second energizing terminal;

and connection means conductively connecting said second current source electrode of said first current control means to said second comparator means first control input terminal, and said second current source electrode of said second current control means to said first comparator means first control input terminal whereby said first and second current comparator means are normally biased to conduction.

3,887,001

TEMPERATURE CONTROL

Robert Lewis Bickerdike, Alton; William Norman Mair, Farnham, and Evan Samuel Thomas, Farnborough, all of England, assignors to The Secretary of State of Defence in Her Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed July 9, 1973, Ser. No. 377,658

Claims priority, application United Kingdom, July 14, 1972, 33072/72

Int. Cl. F28f *7/02*

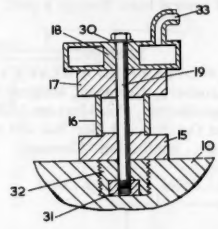
U.S. Cl. 165—81 **5 Claims**

1. In a device having a temperature gradiant thereacross, as from deposition of an alloy from the vapour phase, a temperature controllable collector having a thick metal plate which has a first face adapted to receive deposited alloy and a second face opposite the first face;

a plurality of heat sink members attached in efficient thermal contact with said second face, the heat sink members being provided with internal channels for the passage of coolant; and

flexible connecting means connecting at least some of the heat sink members and arranged to remain leak tight despite expansion or contraction of the apparatus due to heating and

wherein the number, spacing and contact area of the heat sink members are selected so that the radii of curvature



(r) of the said second face of the thick metal plate and of the contracting faces of the heat sink members caused by thermal distortion at the operating temperature are substantially the same as determined by the formula: $r=(K/a)Q$, where K is thermal conductivity, a is the coefficient of linear thermal expansion and Q is the heat flux per circuit area.

3,887,002

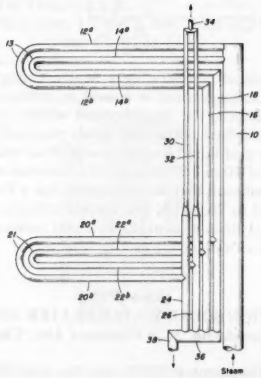
AIR-COOLED HEAT EXCHANGER WITH AFTER-CONDENSER

Willem Schoonman, Wyckoff, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed Jan. 28, 1974, Ser. No. 436,877

Int. Cl. F28b *1/06*

U.S. Cl. 165—113 **7 Claims**



1. In an air-cooled heat exchanger for condensing vapors, having a main condensing section comprising a first outer plurality of U-shaped tubes having upstream legs connected to a vapor inlet manifold and downstream legs connected to a first condensate manifold, a first inner plurality of U-shaped tubes connected at one end to a vapor inlet manifold and at the other end to a second condensate manifold, and means for directing air to flow over the external surfaces of the tubes, the improvement comprising an after-condensing section comprising third and fourth condensate manifolds, a second outer plurality of U-shaped tubes connected at one end to the second condensate manifold and at the other end to the third condensate manifold, a second inner plurality of U-shaped tubes having upstream legs connected to the first condensate manifold and downstream legs connected to the fourth mani-

fold, the second inner plurality of U-shaped tubes being located within the space enclosed within the second outer plurality of U-shaped tubes, means for draining condensate from the third and fourth condensate manifolds, means for condensate vapor from the second outer and inner pluralities of U-shaped tubes, the tubes being so disposed that the same air stream passes over the external surfaces of the tubes of the first and second inner and outer pluralities.

3,887,003

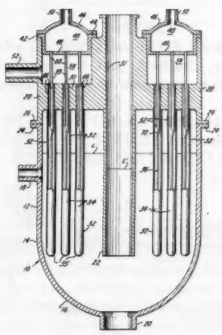
BAYONET TUBE HEAT EXCHANGER

John Polcer, Florham Park, and Robert O. Barratt, Parsippany, both of N.J., assignors to Foster Wheeler Corporation, Livingston, N.J.

Continuation-in-part of Ser. No. 254,150, May 17, 1972, abandoned. This application Oct. 2, 1972, Ser. No. 293,957

Int. Cl. F28d *7/12*

U.S. Cl. 165—142 **6 Claims**



1. A bayonet tube type heat exchanger comprising:
an upper tube sheet;
a main tube sheet having a plurality of holes;
a secondary fluid inlet between said upper tube sheet and said main tube sheet;
a secondary fluid outlet above said upper tube sheet;
a heat section below said main tube sheet sealed off from said secondary fluid by said main tube sheet;
a plurality of bayonet tube assemblies each one comprising:
an outer tube open at the top thereof where it is connected to the main tube sheet at one of said tube sheet holes and closed at its bottom, said outer tube extending into said heat section;
an inner tube coaxial with said outer tube the bottom of said inner tube being adjacent to the closed end of said outer tube the top of said inner tube being in said heat section adjacent to and below said main tube sheet;
a steam tube extending from within said outer tube to said upper tube sheet;
a device within said tube sheet hole between said inner tube and said steam tube, said device having a generally cylindrical outer tubular section flared inward at its bottom and a generally cylindrical inner tubular section extending coaxially within said outer tubular section, said inner tubular section at its bottom communicating through a first opening in said outer section with the space between said inner tube and said outer tube, said inner tube communicating with the space between said outer tubular section and said inner tubular section through a second opening in said outer tubular section; whereby, secondary fluid travelling upward through said bayonet tube assembly in the space between said inner tube and said outer tube toward said steam tube when passing through said main tube sheet, will pass through said first opening and then through said inner tubular section and unheated secondary fluid passing down said bayonet tube assembly through said main tube sheet will pass downward through the space between said inner tubular section and said outer tubular section and then through said second opening into said inner tube.

3,887,004

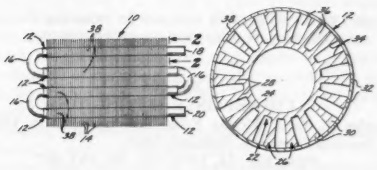
HEAT EXCHANGE APPARATUS

Theodore A. Beck, Riverside, Calif., assignor to Hayden Trans-Cooler, Inc., Corona, Calif.

Filed June 19, 1972, Ser. No. 263,931

Int. Cl. F28f *1/42*

U.S. Cl. 165—179 **15 Claims**



1. A tubular heat exchange conduit which comprises an elongated central tubular core, a plurality of elongated, generally longitudinally arranged, circumferentially spaced heat transfer fins extending generally radially outwardlly from said core, both sides of each of said fins being concavely curved in the general radial direction throughout substantially their entire radial width, with their outer edges being thicker than inner portions thereof and an elongated, tubular shell peripherally engaged about and in heat conducting abutting relationship with the outer edges of said fins, said core, fins and shell defining a plurality of fluid flow channels between adjacent pairs of the fins.

3,887,005

STORM CHOKE

Gary W. Rosenwald, Tulsa, Okla., assignor to Cities Service Oil Company, Tulsa, Okla.

Filed Oct. 3, 1972, Ser. No. 294,745

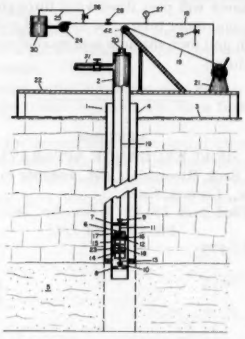
Int. Cl.[2] **F28D** *1/06*

U.S. Cl. 166—72 **15 Claims**

1. In a producing well having a production tubing which extends below the surface to a producing reservoir, apparatus for controlling flow of fluid through the production tubing which comprises:
a. upper and lower valve seats, each located within the production tubing,
b. operable upper and lower valve discs, each located within the production tubing and adapted to respectively engage and mate with the upper and lower seats when operated,
c. separate operating means for continuously urging each valve disc toward engagement with its respective seat,
d. mechanical means for selectively securing the upper valve discs in a position off of its seat and for releasing the

upper disc for movement by its respective operating means, and

e. hydraulic means for securing the other valve lower disc



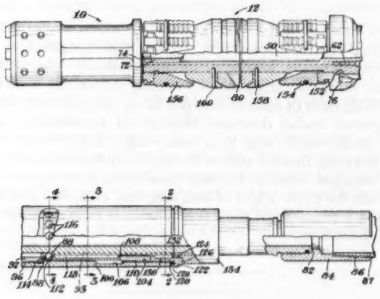
in a position off of its seat and for releasing the disc for movement by its respective operating means.

3,887,006

FLUID RETAINER SETTING TOOL

Charles A. Pitts, Wichita Falls, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 24, 1974, Ser. No. 463,497
Int. Cl. E21b *23/06, 33/129, 33/134*
U.S. Cl. 166—124 **6 Claims**



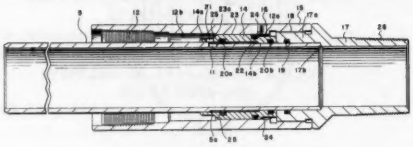
1. A cement retainer setting tool for down hole use in a well bore wherein it is coupled to the lower end of a string of tubing, comprising an elongated hollow mandrel having an upper end and a lower end, an elongated tubular stinger element, said upper end of said mandrel being coupled to said tubing string and said lower end being coupled to one end of said stinger element, said tubing, mandrel and stinger element being in axial alignment, means adjacent to said lower end of said mandrel for coupling a cement retainer device in swiveling relationship with respect to said mandrel, an outer housing having an outer and inner wall and an upper and lower end, said outer housing surrounding said mandrel in spaced relationship with respect thereto from its lower end part to near its upper end part, said outer housing having an array of left hand threads along its inner wall, said left hand threads being disposed at its upper end part, said outer housing having a recessed inner wall part adjacent to the part of said array of left hand threads which is remote from said upper end of said outer housing, a tubular sleeve having an inner and outer wall and upper end and lower end parts, said sleeve fitting between said mandrel and said outer housing and having an array of left hand threads on said outer surface of said upper end part, said last mentioned threads being coupled to said array of said left hand threads of said outer housing, said tubular sleeve having an array of bores extending therethrough, said bores lying generally along a plane perpendicular with the longitudinal axis of said mandrel, said mandrel having a recessed part adjacent to said bores, said bores each containing a detent element, the thickness of said detent elements being such that they extend from said outer housing into recessed part of said mandrel, said recessed inner wall part of said outer housing being disposed no further from said detent elements than the length of said array of left hand threads, and means mechanically coupling said tubular sleeve to said mandrel whereby right hand rotation of said mandrel rotates said sleeve and said left hand threads thereon to force said outer housing downwardly with respect to said mandrel until said detent elements retract into said recessed inner wall part to permit limited lowering of said mandrel through said outer housing.

3,887,007

WELL PACKER ZONE ACTIVATED VALVE

David Lewis Abney, Stafford, and Robert Carl Williams, Spring, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 411,984, Nov. 1, 1973, Pat. No. 3,860,068.
This application Oct. 11, 1974, Ser. No. 513,977
Int. Cl.[2] E21B *23/06;* **G05D** *11/00*
U.S. Cl. 166—224 A **4 Claims**



1. A valve assembly for selectively applying the higher of two available fluid pressures to a well packer assembly, said two fluid pressures arising in the internal bore passage of the tubing string attached to said well packer assembly and the formation pressure below said well packer assembly; said valve assembly comprising:

inner mandrel means having an internal bore passage communicating through said packer assembly to the tubing string above said packer assembly;

outer housing means located concentrically about said inner mandrel means and forming an annular passage therebetween;

first port means between said inner mandrel means internal bore passage and said annular passage;

second port means in said housing means between said annular passage and the well formation; and,

valve member means in said annular passage responsive to fluidic pressure from said first and second port means and adapted to move in response to the higher of said two pressures to block the port means communicating the lower of said pressures.

3,887,008

DOWNHOLE GAS COMPRESSION TECHNIQUE

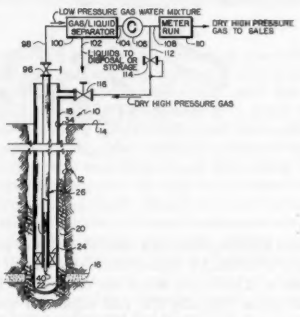
Charles L. Canfield, 5014 Cape Romain, Corpus Christi, Tex. 78412

Filed Mar. 21, 1974, Ser. No. 453,251
Int. Cl. E21b *43/00*
U.S. Cl. 166—267 **12 Claims**

1. A method of continuously producing natural gas for a period of time at the surface from a well providing a first fluid passage affording communication between the surface and an

underground formation which produces both natural gas and a liquid wherein the formation flowing pressure and/or the produced gas volume are insufficient to continuously flow the gas and liquid through the first passage to the surface and a second fluid passage extending from a source of natural gas at a second pressure greater than the formation flowing pressure toward the formation, the method comprising the contemporaneous steps of

1. continuously delivering natural gas from the source through the second passage to a power fluid nozzle inlet of a gas jet compressor located adjacent the formation and accelerating the power gas to a supersonic velocity in a suction chamber downstream of the nozzle;
2. continuously withdrawing natural gas and liquid from the formation and directing the same into the low pressure suction chamber of the gas jet compressor;


LOW PRESSURE GAS WATER MIXTURE
GAS/LIQUID SEPARATOR
METER RUN
DRY HIGH PRESSURE GAS TO SALES
LIQUIDS TO DISPOSAL OR STORAGE
DRY HIGH PRESSURE GAS

3. sequentially deaccelerating the gas through a supersonic diffuser and then through a subsonic diffuser for raising the pressure thereof, the subsonic diffuser comprising a high pressure outlet side of the compressor in communication with the first passage;
4. continuously withdrawing a mixture of the gases of steps (1) and (2) and the liquid of step (2) from the subsonic diffuser at a pressure intermediate the formation flowing pressure and the power fluid inlet pressure and at a volume sufficient to overcome the effect of gravity on liquid droplets;
5. continuously passing the mixture upwardly through the first passage to the surface;
6. continuously removing liquid from the mixture at the surface; and
7. continuously delivering at least part of the gas to sales.

8. Apparatus for producing natural gas from a formation which produces both natural gas and a liquid wherein the formation flowing pressure and/or the produced gas volume are insufficient to continuously flow the gas and liquid to the surface, the apparatus comprising:

conduit means extending from the surface to a location adjacent the formation providing a fluid passage therebetween;

a jet compressor, carried by the conduit means adjacent the lower end thereof, including a power gas nozzle having a subsonic convergent inlet section and a divergent supersonic outlet section, a housing in communication with the divergent nozzle outlet section and providing a low pressure inlet in communication with the formation, and a diffuser including a supersonic convergent inlet section in communication with the divergent nozzle outlet section and the housing, and a subsonic divergent outlet section in communication with the fluid passage;

a source of natural gas at a first pressure greater than the formation flowing pressure and means placing the source in communication with the power gas nozzle inlet for reducing the pressure in the housing and for discharging a mixture of natural gas and liquid through the diffuser outlet at a second pressure intermediate the formation flowing pressure and the first pressure and at a volume sufficient to overcome the effect of gravity on liquid droplets in the mixture;

a flow line connected at the surface to the conduit means for receiving the mixture therefrom;

a free water knockout in the flow line for removing the liquid; and

a meter run in the flow line downstream of the free water knockout for measuring gas flowing therethrough.

3,887,009

DRILLING MUD-CEMENT COMPOSITIONS FOR WELL CEMENTING OPERATIONS

Geo. L. Miller, Houston, Tex., and Horst K. F. Barthel, Hamburg, Germany, assignors to Oil Base, Inc., Houston, Tex., by said Miller and Oil Base Germany, G.m.b.H., Hamburg, Germany, by said Barthel

Filed Apr. 25, 1974, Ser. No. 463,899
Int. Cl. E21b *33/13, 33/14*
U.S. Cl. 166—292 **3 Claims**

1. A method for cementing a well borehole being drilled with a salt water or brine based drilling fluid less than 5 pounds per barrel swellable clay, which comprises:

a. admixing said drilling fluid with an additive composition comprising about 9 to about 40 parts by weight magnesium oxide, about 12 to about 50 parts by weight magnesium sulfate and from about 20 to about 60 parts by weight magnesium carbonate or dolomite to provide a hardenable composition of pumpable viscosity and containing from about 20 to about 40 percent by weight water;

b. pumping said hardenable composition to the desired interval in said well borehole; and

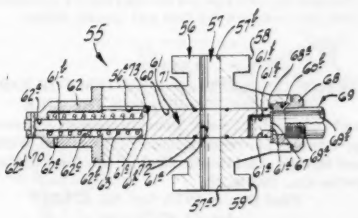
c. ceasing fluid circulation in said borehole to permit said hardenable composition to harden at said desired interval.

3,887,010

WELL FLOW CONTROL METHOD

Phillip S. Sizer, and George G. Grimmer, both of Dallas, Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Division of Ser. No. 130,972, April 5, 1971, abandoned. This application Feb. 8, 1973, Ser. No. 330,700
Int. Cl. E21b *43/00*
U.S. Cl. 166—314 **8 Claims**



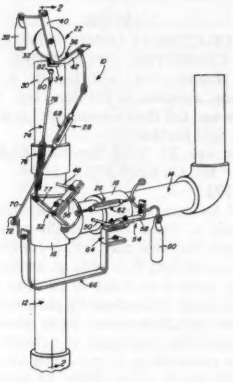
1. A method of controlling flow from a well having a flow conductor therein for conducting well fluids from a producing formation through a Christmas tree having a control valve connected therein to a production flow line at the surface, said method including: producing well fluids from the well producing formation through the flow conductor and the Christmas tree to the production flow line; automatically closing off flow of well fluids from the well flow conductor to the surface production flow line; and introducing control fluid under pressure into said well flow conductor upstream of said closure while flow is closed off from the surface production flow line to load the well to prevent the escape of well fluids from the formation through the flow conductor.

3,887,011

FIRE EXTINGUISHER

Samuel Dokes, and Alvin K. Isaiah, both of New Orleans, La., assignors to Steven R. Plotkin and David Gertler, both of New Orleans, La., part interest to each

Filed June 4, 1974, Ser. No. 476,286
Int. Cl. A62c *3/02*
U.S. Cl. 169—69 **8 Claims**



1. A fire extinguisher for oil wells, comprising, in combination:

a. a first pipe connected to a well and extending from the well to an outlet end;

b. a second pipe branching from the first pipe;

c. valve means for normally unblocking the first pipe and blocking the second pipe, the valve means including a first valve arranged normally-open in the first pipe between the second pipe and the outlet end of the first pipe, a second valve arranged normally-open at the outlet end of the first pipe, and a third valve arranged normally-closed in the second pipe; and

d. actuating means responsive to the presence of a fire in the first pipe for causing the valve means to open the third valve in the second pipe and close the first and second valves in the first pipe for smothering fire contained in the first pipe between the first and second valves.

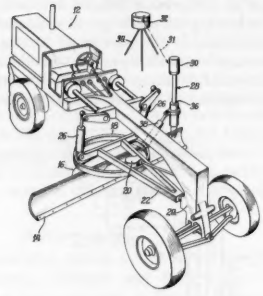
3,887,012

AUTOMATIC LEVELLING SYSTEM FOR EARTH WORKING BLADES AND THE LIKE

Rolland Dale Scholl, Peoria; Donald Frederick Coleman, Dunlap; Edward Lawrence Johnson, Peoria, and William Edward Streight, East Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 3, 1973, Ser. No. 421,119
Int. Cl. E02f *3/76*
U.S. Cl. 172—4.5 **11 Claims**

1. In an earthworking implement control system for maintaining an implement in a fixed relationship to a plane comprising means for producng a narrow beam of radiant energy of a fixed wave length, means for sweeping said beam throughout the plane to produce pulsating radiation at any site in the plane, a multidirectional receiving control mounted on the implement for receiving the beam comprising a receiving means including a plurality of sets of at least two series connected angularly disposed light actuated cells for producing an electric signal in response to impingement of said beam thereon, spacer means for supporting said sets of cells in a stacked vertical relationship so that there is at least a first set of said cells and a second set of said cells spaced from said first set across a null region, a plurality of mutually parallel opaque planar members horizontally disposed on opposite sides of said sets of cells and thereby defining said null region between said sets so said planar members are operable to define at least



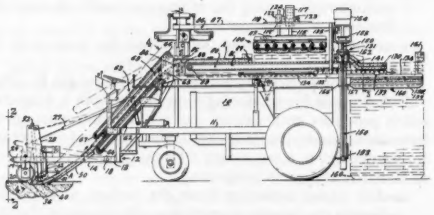
three beam defining channels, and circuit and power means responsive to an electric signal from said cells for moving said implement in a direction when one of said sets produces an electrical signal whereby the null region of said receiving means is moved into the plane of said beam.

3,887,013

SOD CUTTING AND STACKING MACHINE

Wilbur Helberg, Bowling Green, Ohio, assignor to Tri-County Machine Products, Inc., Grand Rapids, Ohio

Filed June 24, 1974, Ser. No. 482,091
Int. Cl.[2] A01B *45/04*; **B65G** *57/00*
U.S. Cl. 172—20 **19 Claims**

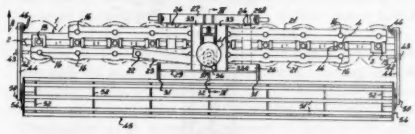


1. An apparatus for cutting and stacking lengths of sod comprising, a wheeled chassis for traversing a sod field, a horizontal cutting mechanism at the forward end of the chassis having means for cutting from the field a plurality of continuous parallel ribbons of sod as the chassis traverses the field, means for conveying such cut sod ribbons in generally parallel fashion from the cutting mechanism rearwardly on said chassis, means rearward of the cutting mechanism for transversely severing the advancing parallel ribbons into groups of strips of generally equal length, means for rotating alternate groups of severed strips at right angles to other groups of strips, and means for stacking such rotated and non-rotated groups of severed strips in criss-cross fashion to provide a vertical stack of sod strips.

3,887,014
SOIL CULTIVATORS

Cornelis Van Der Lely, 7 Brüschemrain, Zug, Switzerland

Continuation of Ser. No. 144,462, May 7, 1971, abandoned. This application Sept. 27, 1973, Ser. No. 401,144
Claims priority, application Netherlands, May 19, 1970, 7007194
Int. Cl. A01b *33/00*
U.S. Cl. 172—54 15 Claims

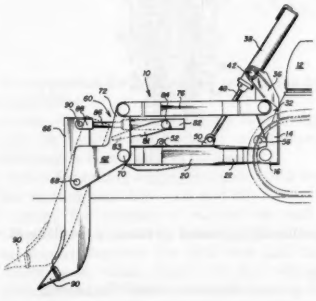


1. A soil cultivator attachment comprising a movable frame and a plurality of soil-working members with downwardly extending tines supported on said frame, said soil-working members being positioned side-by-side in a single row that extends transverse to the direction of travel, each soil-working member comprising a support rotatably mounted on an upwardly extending shaft and each of said tines being mounted on its corresponding support, driving means interconnecting the upwardly extending shafts of said soil-working members, said driving means including eccentric means mounted on said attachment and a horizontally extending driving rod means, said driving rod means being in driving connection with each of said shafts to rotate the same and oscillate said soil-working members and tines to and fro through the soil, the upper ends of said shafts being supported and journalled in said cultivator attachment, said tines being offset with respect to their corresponding upwardly extending shafts, said offset being such that adjacent soil-working members work overlapping paths when oscillated, said frame having attachment means at the forward end thereof for coupling to a prime mover.

3,887,015
CONVERTIBLE RIPPER AND GOUGER AND TOE TRIMMER

Leon O. Kelley, P.O. Box 488, Stamford, Tex. 79553

Filed Apr. 30, 1973, Ser. No. 355,870
Int. Cl. A01b *63/10*, *63/32*; A01g *23/06*
U.S. Cl. 172—254 1 Claim



1. A plow assembly comprising:

a frame having first, second, third and fourth links for connection to a prime mover; means on said first link for rigid connection to the prime mover; said second link comprising a pair of parallel spaced linkage bars, a cross-bar rigidly connecting said spaced linkage bars; a first connection means on said first link for selectively pivotally connecting one end of each of said linkage bars at a first point on said first link; a second connection means on said first link for selectively pivotally connecting said one end of each of said linkage bars to a second point on said first link; said third link positioned to extend parallel to said second link when said second link is connected to said first link at the first point of connection; said third link having a pair of outwardly diverging arms at one end, said outwardly diverging arms having their ends pivotally connected to said first link at a point spaced away from the first and second points of connection of said second link, said third link extending parallel to said second link when said second link is connected to said first link at the first point; said fourth link pivotally attached between the ends of said linkage bars of said second link opposite the ends connected to said first link and the end opposite said diverging portion of said third link;

a first variable link hydraulic cylinder assembly with one end pivotally attached to said first link and the other end pivotally attached to said third link for raising and lowering said frame relative to said first link, said cylinder being centrally positioned to extend between said bars of said second link;

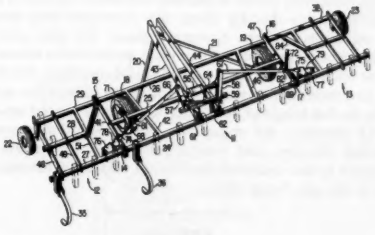
a shank assembly having a shank and a downwardly curved toe, said shank being pivotally connected to said fourth link in either a first or second position, said toe pointing down and away from said first link in said first position and down and towards said first link in said second position; and

a second variable link hydraulic cylinder positioned to extend between said bars of said second link and with one end pivotally connected to said fourth link and with its other end pivotally connected to said shank on said shank assembly, said second cylinder operable to pivot said shank with respect to said fourth link to operate said plow assembly as a highway cut trimmer when said shank is in said first position and as a gouger when said shank is in said second position.

3,887,016
FIELD CULTIVATOR WING LIFT

Loren F. Hansen, Ankeny, Iowa, assignor to Koehring Company, Milwaukee, Wis.

Division of Ser. No. 314,679, Dec. 13, 1972. This application May 30, 1974, Ser. No. 474,589
Int. Cl. A01b *23/04*, *73/00*
U.S. Cl. 172—311 5 Claims



1. A cultivator comprising:

A. at least two frame sections;

B. pivot means connecting said frame sections together in side-by-side relationship for movement of a first frame section relative to a second frame section between a working position substantially in horizontal alignment with said second frame section and a transport position obliquely over said second frame section; and

C. power means connected to said first frame section including a reciprocating power source and a multibar linkage, said power means:

1. effecting raising said first frame section from said working position to an interim position upon movement of said power source in a first direction,
2. effecting movement of said first frame section from said interim position to said transport position upon movement of said power source in a second direction opposite to said first direction,
3. effecting movement of said first frame section from said transport position to said interim position upon the next movement of said power source in said first direction, and
4. effecting movement of said first frame section from said interim position to said working position upon the next movement of said power source in said second direction.

3,887,017

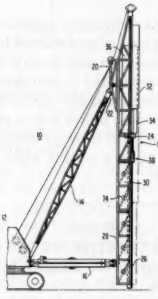
MODULAR LEADS FRAME WITH NOISE ABATEMENT SYSTEM AND PILE FEEDER

Leonard L. Frederick, 15 Crestview Ter., Whippany, N.J. 07981

Continuation-in-part of Ser. No. 142,173, May 11, 1971, Pat. No. 3,747,689. This application May 14, 1973, Ser. No. 359,782

Int. Cl. B21j

U.S. Cl. 173—46 **14 Claims**



1. In a pile driving machine including a boom, a leads frame operatively associated therewith and a pile driving hammer, the improvement comprising: a plurality of noise abating shield members; means mounting said shield members to said leads frame to thereby abate the noise resulting from the driving impact of the hammer against the pile; and drive means, wherein said shield members are mounted to said leads frame such that a first set of said shield members are stationary and mounted to said leads frame to extend for substantially the full height of said leads frame and a second set of said shield members are engageable with said drive means and movable thereby, said second set of shield members being adjacent to the operative position of said drive hammer relative to the pile being driven.

3,887,018

FLUID DRIVEN HAMMERS

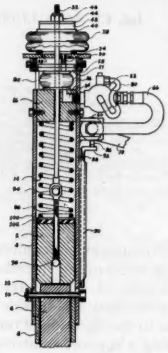
Murray L. Jayne, 8609 Lakeshore Dr., Kenosha, Wis. 53140

Filed Jan. 25, 1974, Ser. No. 436,483

Int. Cl. B25d *9/00*

U.S. Cl. 173—120 **8 Claims**

1. An impact tool comprising a frame including an elongated housing open at one end, a hammer element longitudinally movable within said housing, resilient means connected to said frame and to said hammer element in relation to urge said hammer element in one direction, fluid actuated means on said frame, means permanently connected with said fluid actuated means, extending to and connected in fixed relation with said hammer element in position to move said hammer element, when said fluid actuated means is activated, in the other direction, and valve means connected to said fluid actuated means and constituted to suddenly release pressure fluid



from said fluid actuated means to exhaust said fluid actuated means to free said fluid actuated means and said hammer element to be propelled in the first mentioned direction by said resilient means.

3,887,019

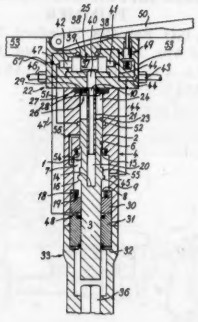
HYDRAULIC PERCUSSIVE IMPLEMENT

Lionel Arthur Reynolds, Painswick near Stroud, and David Richard James, Hasfield, both of England, assignors to A. F. Hydraulics Limited, England

Filed May 1, 1972, Ser. No. 249,223

Int. Cl. B25d *9/26*

U.S. Cl. 173—134 **26 Claims**



1. A hydraulically-operated percussive implement which includes:

a. a casing,

b. first and second chambers within the casing,

c. a striker piston reciprocable within the casing,

d. means for introducing pressurised fluid into said chambers and for controlling the fluid pressures in said chambers,

e. said striker piston having a relatively large first effective piston area which partly bounds the first chamber and is acted upon when pressurized fluid is introduced into the first chamber to cause the striker piston to execute a working stroke,

f. said striker piston also having a relatively small second effective piston area which partly bounds the second chamber is acted upon by pressurized fluid introduced into the second chamber, and when the fluid pressure in the first chamber is reduced, to cause the striker piston to execute a return stroke,

g. said second chamber having a wall at the end thereof remote from the first chamber which is formed with a sealed aperture through which an end portion of the striker piston projects,

h. the casing including tool holding means for locating a tool so as to be struck by the end of the striker piston towards the end of the working stroke thereof,

i. a collar on that portion of the striker piston which passes through the second chamber, said collar having opposing effective surface areas which are normally both exposed to the pressure in the second chamber and being of such dimensions as to permit of passage of fluid in the second chamber around the collar during normal reciprocatory movement of the striker piston,

j. an overshoot dashpot cavity situated at the end of the second chamber remote from the first chamber and positioned so that, in the event that the length of the working stroke should exceed a normal length as a result of removal of external resistance to advance of the tool, the collar will enter the cavity to trap fluid therein,

k. the effective area of the collar presented to the dashpot cavity being substantially in excess of the second effective piston area of the striker piston, and

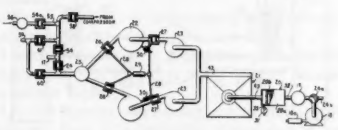
l. restrictor means provided as the sole path for escape of fluid trapped in the cavity on entry thereinto of the collar.

3,887,020

APPARATUS FOR GEOLOGICAL DRILLING AND CORING

John D. Chaffin, 851 Haverford Ave., Pacific Palisades, Calif. 90272

Continuation-in-part of Ser. No. 132,001, April 7, 1971, abandoned. This application Jan. 15, 1973, Ser. No. 323,852
Int. Cl. E21b *21/00;* **E21c** *7/02*
U.S. Cl. 175—206 **10 Claims**



1. An apparatus for drilling and recovering geological samples comprising:

A. rotary drilling means having a hollow drill stem and a drill bit secured to the lower end thereof for forming continuous bore holes in the earth;

B. means for raising and lowering said drill stem and means for rotating said drill stem and bit;

C. means for creating a vacuum in said hollow stem whereby a current of air is sucked down through an annulus formed between the drill stem and the earth and is drawn up the inside of said drill stem while entraining the drilled material from the bore hole:

D. separator means for removing the drilled material from the air stream;

E. means for guiding the air and entrained material from the top of the drill stem to the separator means; and

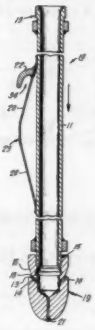
F. means selectively positionable for disconnecting the vacuum means, the separator means and the entrained material guiding means and for connecting a drilling fluid pump to the drill stem for pumping drilling fluid down the drill stem.

3,887,021

METHOD AND APPARATUS FOR BORING DRAIN HOLES IN GROUND

Ketil E. Elbert, 631 Cote St., Antoine Rd., Westmount, Quebec, Canada

Filed Feb. 4, 1974, Ser. No. 439,142
Int. Cl. E21b *7/18*
U.S. Cl. 175—422 **6 Claims**



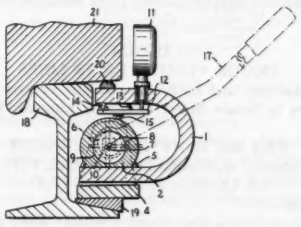
1. A boring device for boring a hole in soft ground, such as clay or the like, and for insertion of a drain element in said hole, said device comprising a rigid hollow tubular body having a nozzle at an end thereof and connectable means at an opposite end for securement to water delivery means, said nozzle having a forwardly directed jet orifice and at least two retro-directed orifices for causing penetration of said body into said ground, and hook means secured to an outer wall of said tubular body for releasably engaging an end of said drain element to be positioned in a hole bored by said device.

3,887,022

RAILWAY VEHICLE-LOAD MEASURING METHOD AND DEVICE

Tzvyatko Penchev Stanev, Sofia, Bulgaria, assignor to DSO "Bulgarski Darjavni Jeleznitzi", Sofia, Bulgaria

Filed Aug. 16, 1973, Ser. No. 388,888
Int. Cl. G01g *19/02*
U.S. Cl. 177—146 **3 Claims**



1. An apparatus for measuring the load of a vehicle wheel, comprising a support, a U-shaped shackle on said support having a lower arm and an upper arm, said arms being relatively deflectable, a crankshaft journaled on said support and having an eccentric portion received between said arms, a bushing fixed to the lower arm and receiving said eccentric portion, a rocker arm fulcrumed on said bushing and having one end engaged by the upper arm of said shackle, a compressive-force guage on said upper arm engaging another end of

said rocker arm, and a manual lever connected to said shaft for raising said lower arm, thereby bringing said upper arm into engagement with said wheel and causing relative deflection of said upper and lower arms and rotation of said rocker arm.

3,887,023

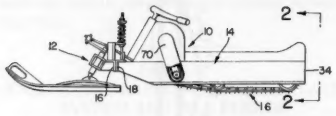
SNOWMOBILE REAR DRIVE CONSTRUCTION

Carl P. Henning, 1231 Stellma La., Rochester, Mich. 48063

Filed Feb. 27, 1973, Ser. No. 336,250

Int. Cl. B62m *27/02*

U.S. Cl. 180—5 R **17 Claims**



1. In a snowmobile rear drive construction, the combination comprising

a framing structure having a top plate web portion, depending leg members at each lateral side thereof and a forward transverse rib member conjoined to each other,

dual drive tracks,

a longitudinally extending, vertically disposed, substantially planar medial support plate member affixed to said top plate web portion and said forward transverse rib member and disposed between said dual drive tracks,

an engine driven front end cross shaft rotatably mounted upon said framing structure,

a drive track support frame structure for each said drive tracks pivotally mounted upon said cross shaft and slidingly engaged with said medial support,

slide guide means affixed to each said drive track support frame structure and slidable upon and relative to said medial support,

a longitudinally extending guide frame for each said drive tracks secured to each said drive track support frame structure,

a drive sprocket for each said drive tracks fixedly mounted on said cross shaft and rotatable therewith, and in engagement with said drive track to drive the same upon and about said guide frame,

and an equalizing member pivotable and retained upon said medial support plate member intermediate its ends, extending transversely and to either side thereof, disposed for bearing engagement upon each said drive track support frame structure to maintain said drive tracks in substantially parallel ground plane terrain contact.

3,887,024

MOTOR VEHICLE DRIVE LINES

Koichi Takahashi, and Eiichi Abe, both of Yokohama, Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

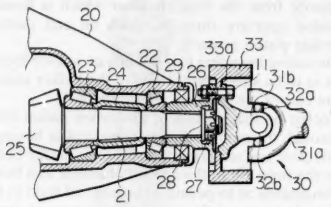
Filed May 16, 1972, Ser. No. 253,875

Claims priority, application Japan, Nov. 12, 1971, 46-89785

Int. Cl. B60k *17/22;* **B60b** *17/16*

U.S. Cl. 180—70 P **5 Claims**

1. A driven vehicle comprising a vehicle body, a propeller shaft and a final drive unit, the final drive unit comprising a pinion drive shaft rotatable supported by pinion bearings in an axle housing, a spacer provided on a portion of the pinion drive shaft spacing the bearings from each other, a pinion driving flange provided on the pinion drive shaft and rotatable therewith, and a rear yoke of a rear universal joint fixedly connected to and rotatable with the pinion driving flange, and an inertial mass of a predetermined weight coaxially coupled with and rotatable with the pinion drive shaft, said inertial mass having a circular wall section interposed between said rear yoke said pinion driving flange and secured thereto said mass being positioned with its center of gravity aligned with the axis of said pinion drive shaft adjacent a forward end portion thereof, so as to increase the predetermined magnitude of the moment of inertia of the pinion drive shaft to cause a reduction in the otherwise occurring resonance frequency of the pinion drive shaft and in the vibrations produced in the final drive unit and therefrom transmitted to the vehicle body.



3,887,025

RIGID REAR AXLE SUSPENSION SYSTEMS

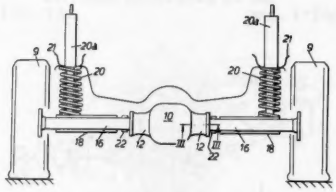
Helmut Kaltwasser, Eltville, Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 3, 1973, Ser. No. 420,759

Claims priority, application Germany, Dec. 23, 1972, 2263374

Int. Cl. B62d *21/00*

U.S. Cl. 180—73 TL **6 Claims**

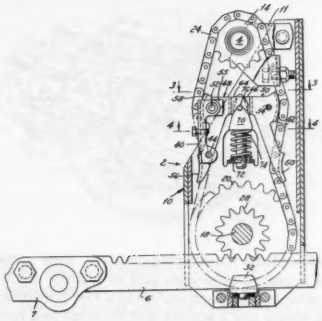


1. A rigid rear axle suspension system for a motor vehicle, utilising non-guiding suspension springs, comprising a differential housing, a pair of axle tubes rotatably supported at inboard ends thereof by respective laterally opposed portions of the differential housing, a pair of longitudinal control arms projecting in a forward direction from the respective axle tubes, means fixedly securing a rear end of each control arm to the respective axle tube, means disposed at a front end of each control arm for providing an articulated connection to a portion of the vehicle frame, a pair of longitudinal cantilever arms projecting in a forward direction from the respective axle tubes, means fixedly securing a rear end of each cantilever arm to the respective axle tube, a cross-member mounted on the differential housing for pivotal movement about a longitudinal centre axis, means providing an articulated connection between a front end of each cantilever arm and a respective end of the pivotal cross-member, and means providing resilient take-up of changes in lateral spacing between the pivotal cross-member and the respective axle tubes, corresponding to vehicle cornering or other conditions involving unequal travel of said suspension springs.

3,887,026
MOTOR VEHICLE POWER STEERING DEVICE

William D. Allison, Grosse Pointe Farms, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sept. 24, 1973, Ser. No. 400,439
Int. Cl. B62d 5/08
U.S. Cl. 180—79.2 2 Claims



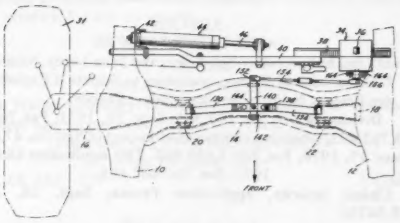
1. A power steering device for a motor vehicle comprising:
a driving sprocket constructed to be connected to a steering wheel,
a driven sprocket constructed to be connected to a pinion gear,
a chain drivingly interconnecting said driving sprocket and said driven sprocket,
a laterally translatable toothed rack in meshed engagement with said pinion gear,
said rack being constructed to be connected to an element of the steering linkage system of said motor vehicle,
a chain tensioner means engaging said chain,
said chain tensioner means being displaceable in response to the transmission of a force from said driving sprocket through said chain to said driven sprocket,
a power steering valve having first and second valve control means,
said first valve control means being actuatable in response to displacement of said tensioner means,
said second valve control means being actuatable by means independent of said first valve control means and said tensioner means,
said power steering valve being constructed to direct power steering fluid to a hydraulic motor that is arranged to apply a force to said element of said steering linkage system in response to the actuation of either said first or second valve control means.

3,887,027
STEERING MECHANISM WITH LATERAL FORCE CORRECTION

William D. Allison, Grosse Pointe Farms, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sept. 24, 1973, Ser. No. 400,440
Int. Cl. B62d 5/08
U.S. Cl. 180—79.2 7 Claims

1. A power steering device for a motor vehicle comprising:
a power steering valve constructed to be operatively interposed between a power steering pump and a power steering booster cylinder,
first and second mutually independent valve control means operatively connected to said power steering valve,
said power steering valve being constructed to direct power steering fluid from said pump to said booster cylinder in response to the actuation of either of said valve control means,
one of said valve control means being constructed to be automatically actuated in response to manual actuation of a motor vehicle steering gear,
sensing means constructed to provide a signal in response to a force arranged to deviate said vehicle from a predetermined course,

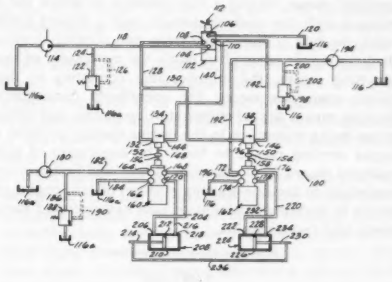


the other of said valve control means being constructed to be automatically actuated in response to said signal provided by said sensing means,
sprung and unsprung motor vehicle components,
a suspension arm interconnecting said components,
resilient bushing means connecting said arm to said sprung component,
said sensing means constructed to provide said signal in response to deflection of said resilient bushing means.

3,887,028
STEERING SYSTEM

Raymond L. Goff, and Jim L. Rau, both of Lafayette, Ind., assignors to TRW Inc., Cleveland, Ohio

Filed Feb. 25, 1974, Ser. No. 445,209
Int. Cl. B62d 5/08
U.S. Cl. 180—79.2 R 13 Claims



1. A vehicle steering system comprising,
two independent vehicle steering systems which when actuated either together or individually will effect vehicle steering, each of said steering systems including,
a steering cylinder connected to effect vehicle steering upon actuation thereof,
a metering mechanism for metering fluid flow to said steering cylinder, and
a valve for directing that flow to said steering cylinder, and
means for operating each system upon operator actuation thereof,
said metering mechanism and said valve for each system comprising parts of a fluid controller having an input shaft which when turned effects actuation of said valve and said metering mechanism,

said means for operating said systems comprising means for effecting rotation of said input shaft of each of said fluid controllers, and

said means for effecting rotation of said input shaft comprising a fluid motor connected with the shaft and a mechanism operated upon turning of the vehicle steering wheel for actuating said fluid motor.

3,887,029

ANTI-THEFT DEVICES

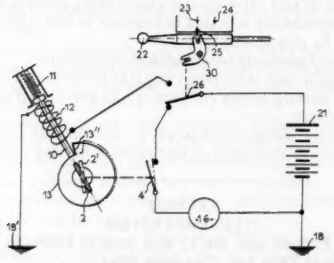
Paul Lipschutz, Croissy-Sur-Seine, and Jean Leroy, Saint-Cyr-L'Ecole, both of France, assignors to Societe d'Exploitation des Brevets Neiman, Neuilly s/Seine, France

Division of Ser. No. 182,385, Sept. 21, 1971, Pat. No. 3,782,493, which is a continuation-in-part of Ser. No. 47,706, June 19, 1970, Pat. No. 3,688,861. This application Oct. 17, 1973, Ser. No. 407,405

Claims priority, application France, Sept. 28, 1970, 70.34733

Int. Cl. B60r *25/02*

U.S. Cl. 180—114 **5 Claims**



1. In an anti-theft device having a lock including key-operated means, a bolt adapted to engage a control element of an automotive vehicle with a Diesel engine and with mechanical engine starting means, said lock including key-operated means having a first position in which the bolt is engaged with the control element and a second position in which the bolt is disengaged from said control element, and blocking means adapted to block the movement of said key-operating means, the improvement consisting in that said device comprises means for operatively connecting said blocking means to said engine starting means, said connecting means being responsive to the engine starting position of said engine starting means to block the movement of said key-operated means from said second into said first position, and responsive to the non-starting position of said engine starting means to permit movement of said key-operated means between said two positions.

3,887,030

DUCT SYSTEMS FOR AIR CUSHION VEHICLES

Christopher John Fitzgerald, 6 A'Beckett St., Coburg, Australia (3058), and Robert Keith Wilson, 176 Woods St., West Newport, Australia (3015)

Filed Dec. 11, 1973, Ser. No. 423,796

Claims priority, application Australia, Dec. 15, 1972, 1647/72; July 2, 1973, 3886/73

Int. Cl. B60v *1/14*

U.S. Cl. 180—121 **18 Claims**

1. An air cushion vehicle comprising:

a base;

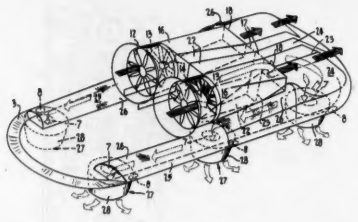
power supply means located on the base comprising two axial flow fans located on opposite sides of the fore-aft mid-line of the vehicle;

stator means immediately downstream of said fans;

two separate and independent duct systems each connected to and supplied, in use, by a respective one of said fans and located on opposite sides of said mid-line;

splitter means positioned immediately downstream of said stator means for dividing each duct system into a propulsion duct and an air cushion duct;

the propulsion ducts extending rearwardly to adjacent the rear end of the vehicle, said propulsion ducts being positioned laterally closer to the sides of said vehicle than the openings of the air cushion ducts to said fans, and said



propulsion ducts converging towards their outlets to provide means to pressurize said air cushion ducts; and

said air cushion ducts each including a first portion extending rearwardly and a second portion extending forwardly of the vehicle, said rearwardly extending portion including a diffuser debouching into a chamber of relatively large cross-sectional area intermediate said rearwardly and forwardly extending portions.

3,887,031

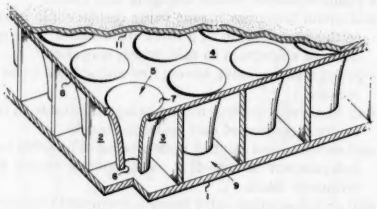
DUAL-RANGE SOUND ABSORBER

Leslie S. Wirt, Newhall, Calif., assignor to Lockhead Aircraft Corporation, Burbank, Calif.

Filed June 11, 1973, Ser. No. 369,100

Int. Cl. E04b *1/84*

U.S. Cl. 181—33 G **10 Claims**



1. Wide-range apparatus for the absorption of an ambient sound field, comprising:

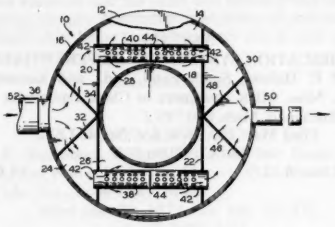
means defining a sound-confining chamber; and,

an acoustical horn having a predetermined cutoff frequency and having a sound-receiving mouth at one end and a smaller throat at the other end of the horn path, said path being characterized by a continuously changing cross-sectional area along its length, said horn being nested within said chamber so as to have said mouth acoustically coupled to the exterior of said chamber and said throat acoustically coupled to the interior of said chamber, the internal volume defined by said chamber and said horn comprising a damped helmholtz resonator whereby incoming sound above said cutoff frequency will be propagated from said mouth towards said throat whereupon said sound will be reflected back toward said mouth due to the discontinuity at the junction of said throat and said chamber, thereby causing destructive cancellation between incoming and reflected sound waves, and whereby the inertia of the air mass in said horn resulting from incoming sound below said cutoff frequency is just compensated by the air confined in said chamber so as to cause helmholtz resonance to occur within said chamber.

3,887,032
MUFFLERS

Frank N. Harris, 4761 S.W. Martha St., Portland, Oreg. 97221

Filed Aug. 2, 1974, Ser. No. 494,224
Int. Cl. F01n *1/02*
U.S. Cl. 181—59 14 Claims

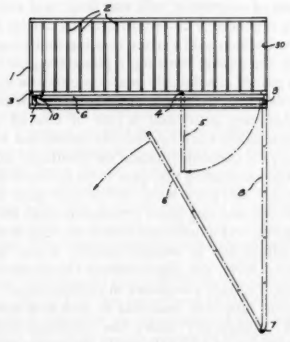


1. In an improved muffler,
toroidal chamber means,
inlet means opening into one portion of the toroidal chamber means,
outlet means opening into a second portion of the toroidal chamber means spaced around said toroidal chamber means from said one portion,
a pair of partitions dividing the toroidal chamber means into an inlet chamber, an outlet chamber, and two side chambers between the inlet chamber and the outlet chamber, one of the partitions having inlets to the side chambers and the other partition having outlets to the outlet chamber,
and baffle means in the side chambers between the inlets and the outlets.

3,887,033
FIRE ESCAPE

Harry V. Breinig, 8660 Burton Way, Los Angeles, Calif. 90048

Filed Jan. 4, 1974, Ser. No. 430,894
Int. Cl. E06c *9/10*
U.S. Cl. 182—78 3 Claims

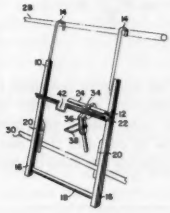


1. A fire escape for use with a building having a window, said building comprising:
a frame having three interconnected vertical walls and a horizontal rectangular floor secured to the bottom of the walls;
means securing said frame to the outside of the building in front of the window, the non-adjacent two of said walls being separated by a space which is adjacent the window;
a trapdoor pivotally connected the floor;
a folded ladder pivotally connected to said floor and disposed below the trapdoor, the ladder being in folded sections, the topmost section supporting the door in place whereby the door falls to vertical position when the ladder unfolds, the door being spaced from the ladder to define a space through which escapees can pass from the window to the ladder; and
means to release said ladder whereby it unfolds to vertical position for use by gravity.

3,887,034
PORTABLE PIPE CLAMP

John Walter Sawatzky, Belmont, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,374
Int. Cl. E06c *7/48*
U.S. Cl. 182—129 1 Claim



1. A device for clamping of a flexible conduit, pipe or tube, which device may be fitted about the rungs of a ladder, with said device hooking over the horizontal rungs of a ladder installed in the vertical position,
said device including two longitudinal support members joined by a cross member perpendicular to the two support members with the upper end, in the installed position of each support member, terminating in an open hook of a size to fit about a ladder rung and with each support member being fitted with an opened hook member at its rear of a size to fit about a second rung of a ladder to which the device is attached, together with a clamping device for clamping a pipe which is fixed to the two support members so as to lie generally parallel to a rung of an attached ladder, with the clamping device consisting of two opened angled members rotatably joined to each other, in which
one of the clamp members is fixed to both support arms of the device with the other clamp member being fitted in rotatable relation to the fixed clamp member, with the rotatable clamp member being of shorter length than the fixed clamp member and with an undercut section of the fixed clamp member located adjacent to the end of the rotatable clamp member so that a pipe secured by both clamp members may be cut by a saw without the saw engaging the fixed clamp member.

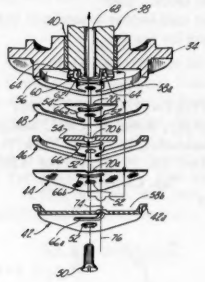
3,887,035
COMPRESSOR OIL PUMP WITH FILTER

Billy B. Hannibal, Tecumseh, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Mar. 21, 1974, Ser. No. 453,280
Int. Cl. F01m *1/10*
U.S. Cl. 184—6.16 12 Claims

1. An oil pump and filter device for a gas compressor comprising in combination a crankshaft with a lubricating oil passage extending generally axially therein from one end thereof, a sump for lubricating oil disposed adjacent the crankshaft, a housing with said one end of the crankshaft journalled therein, a discharge chamber formed in cooperation with said housing adjacent said one end of said crank-

shaft, a centrifugal impeller received in said discharge chamber and fixed to said crankshaft for rotation therewith, said impeller having an inlet chamber communicating with both lubricating oil in the sump and said discharge chamber for discharging oil into said discharge chamber at a higher pressure than the oil in the sump in response to rotation of said impeller by the crankshaft, and a filter positioned in flow communication with said discharge chamber for filtering therethrough the flow of oil after it is discharged from said impeller and before entering the axial oil passage of the crankshaft.

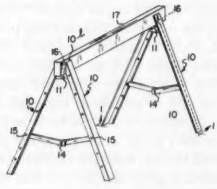


3,887,036

COLLAPSIBLE SAWHORSE STRUCTURE

Stanley H. Telban, 682 Meadowland Dr., Richmond Heights, Ohio 44143

Filed June 10, 1974, Ser. No. 477,591
Int. Cl. F16m *11/00*
U.S. Cl. 182—186 **1 Claim**



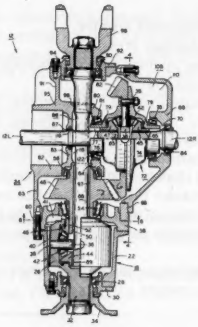
1. A collapsible sawhorse structure comprising a pair of linear rigid legs, as a fulcrum support a short rigid bar, pivot pins joining opposite ends of said bar to each of said legs near the top and spaced equally from the upper ends thereof, a locking toggle located between said legs and having two right links of equal length, a pivot connecting the inner ends of said links, a pivot connecting the outer end of each link to its associated leg more than half-way down each leg, said last named pivots being equally spaced from the bottoms of said legs, means limiting the swinging of said links in a direction to spread said legs about said fulcrum pivot pins to a position where said toggle breaks slightly downwardly, each of said legs being a structural metal angle having a first leg extending at right angles to an associated stringer and a second leg extending parallel to said stringer, said pivot pin connections to said legs passing through said first leg, and a series of sharp saw tooth shape biting projections facing inwardly on the upper ends of said first legs above said fulcrum support bar so positioned that, when they have well entered into a stringer, the uppermost end of said second leg firmly engages said stringer and braces an assembled sawhorse against stress endwise of said stringer, said projections embedded in said stringer providing the sole connection between said legs and said stringer, whereby a wooden stringer may be placed with its opposite ends respectively between the spread upper ends of two of said pairs of legs spaced along said stringer while the lower portions of said legs below said bar are at least partially collapsed, then said lower portions of said legs may be spread about said fulcrum pivot pins until said toggles break slightly downwardly thus causing said biting projection to bite into said wooden stringer to firmly fix the connections of each of said pairs of legs to said stringer. stringer.

3,887,037

LUBRICATION SYSTEM FOR DIFFERENTIALS

Raymond P. Haluda, South Bend, Ind., and Kenneth W. Nelson, Niles, Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Mar. 20, 1974, Ser. No. 452,872
Int. Cl. F01m *9/12*
U.S. Cl. 184—6.12 **18 Claims**



1. In an axle assembly of the type having a bevel gear drive, including a pinion gear and a ring gear, and further including an axle differential attached to said ring gear and rotatable about the axis of rotation of said ring gear, said axle differential including a generally closed differential carrier housing, a cross disposed within said carrier housing and connected for rotation with the carrier housing, a planetary gear carried by said cross, a pair of coaxial side gears on opposite sides of said cross rotatable about the ring gear axis of rotation and in mesh with said planetary gear, and a pair of coaxial oppositely projecting axle shafts each operatively connected with one of said side gears for conjoint rotation therewith; an axle housing containing and journalling said gear drive and axle differential and providing a lubricant sump below said gear drive, with said bevel pinion and ring gears rotating through the lubricant within said sump and a lubricant system for said axle differential which differential is located entirely above the normal lubricant sump level, the improvement characterized in that said lubrication system comprises in combination;

a. a separate lubricant reservoir in said axle housing substantially completely above the lubricant level of said sump with one of said axle shafts projecting through said reservoir and said pinion gear being journalled in said reservoir wall;

b. first lubricant collection channel means formed in an upper portion of said axle housing and having one end opening near the rotation path of said ring gear and the other end opening into said reservoir;

c. second lubricant collection channel means formed in another upper portion of said axle housing and having one end opening near the rotation path of said pinion gear and the other end opening into said reservoir;

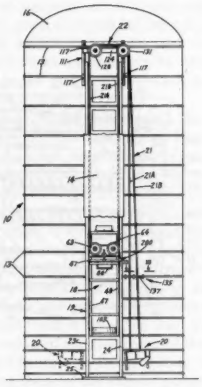
d. said one axle shaft that projects through said reservoir being substantially below the top of said reservoir and being in substantial sealing relationship with said reservoir toward the hub end of said one axle shaft at its exit area from said reservoir; and

e. lubricant delivery passage means from said reservoir for said axle differential having one end opening into said reservoir at the entrance area of said one axle shaft into said reservoir and the other end opening into said differential, thereby permitting lubrication of said axle differential while being located entirely above said axle sump lubricant level.

3,887,038
LIFT APPARATUS

Floyd E. Buschbom, Long Lake; Glen Dale Hansen, Maple Plain, and Walter W. Wolfe, Mound, all of Minn., assignors to Veda, Inc., Long Lake, Minn.

Filed Jan. 19, 1973, Ser. No. 325,173
Int. Cl. B66b *5/12*
U.S. Cl. 187—27 **32 Claims**

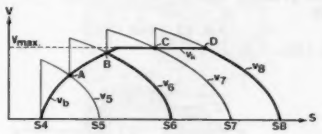


1. A lift apparatus for use with a structure comprising: a carriage, track means locatable adjacent to the structure for guiding the carriage up and down in a generally upright path, winch means for moving the carriage, said winch means having rotatable drum means, reversible drive means drivably connected to the drum means to rotate the drum means, said drive means including a motor operable to selectively rotate said drum means in opposite directions, cable means connected to the drum means and carriage, means adjacent to the upper end of the track means for accommodating the cable means, said cable means extended from the drum means over the means adjacent to the upper end of the track means and to the carriage whereby on operation of the drive means in one direction the drum means rotates to wind the cable on the drum means so that the carriage is moved upwardly in the upright path and on operation of the drive means in the opposite direction the drum means rotates to unwind the cable from the drum means so that the carriage means moves downwardly in the upright path, means to sense the load tension of the cable means, said means to sense the tension being operable to stop the motor in response to a reduction of load tension on the cable means and maintain the cable means in tension and hold the cable means in operative relation with the drum means.

3,887,039
DEVICE FOR CONTROLLING A LIFT OR THE LIKE

Klaus Boniek, Berlin, Germany, assignor to Inventio Aktiengesellschaft, Hergiswil/NW, Switzerland

Filed Apr. 8, 1974, Ser. No. 459,198
Claims priority, application Switzerland, Apr. 18, 1973, 5838/73
Int. Cl. B66b *1/28*
U.S. Cl. 187—29 R **8 Claims**



1. A device for controlling a lift provided with a lift-car which is displaceable along a lift-shaft interconnecting a plurality of storeys, the device comprising drive means responsive to a control signal to displace the lift car along the shaft, a plurality of storey switch devices each associated with a respective storey and each arranged to generate a storey signal when the lift is displaced past the respective switch device, lift-call signal processor means provided with storage means to store lift-call signals for respective storeys and with stepping means having a respective stepping stage corresponding to each storey, the processor means generating a halt signal when the stepping means reaches a stepping stage corresponding to a storey for which a lift-call signal is stored in the storage means, first signal generator means responsive to an initiating signal to generate a control signal which increases towards a predetermined maximum value to control the acceleration of the lift and which — during travel of the lift at its maximum speed — is maintained at said predetermined maximum value, second signal generator means for generating a succession of retardation signals each of which initially has a respective maximum value and which decreases in value to correspond at any moment to the maximum lift-car speed permissible for the service of the next servable storey, comparator means to compare the signal generated by the first signal generator with the respectively present retardation signal, the comparator means — the absence of the halt signal — being responsive to a predetermined difference in magnitude between the compared signals to generate a stepping pulse and — in the presence of the halt signal — to apply the respectively present retardation signal to the drive means, the stepping means being stepped on through a switching step on departure of the lift-car from its initial location at the start of each journey and being stepped on through a switching step in response to each stepping pulse generated by the comparator means, the second signal generator means being responsive to each stepping movement of the stepping means to generate a further retardation signal, wherein the second signal generator means comprises means for generating a series of distance-analogue signals each corresponding in magnitude to the distance between storeys immediately successive in the direction of travel of the lift car, means for connecting successive ones of the distance-analogue signals in a stepwise manner to output means of the distance-analogue signal generator on the occurrence of each stepping movement of the stepping means, means for disconnecting the distance-analogue signals in a stepwise manner from the output means on the occurrence of each storey signal, integrator means for integrating a signal provided by an actual value signal generator mechanically coupled to the drive means, the output signal of the integrator meane being of zero value at the beginning of each lift-car journey and being re-set to zero value on the occurrence of each storey signal, difference signal generator means to provide an output signal equal at each instant to the difference between the output signal of the distance-analogue signal generator and of the integrator means, and root former means

having input means connected to the output of the difference signal generator means.

3,887,040

BRAKE LINING THICKNESS MONITORING DEVICE

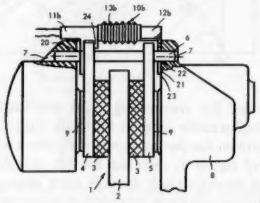
Ernst-Ulrich Simon, Oberursel, and Horst Ullrich, Schoeneck, both of Germany, assignors to VDO Adolf Schindling AG, Hamburg, Germany

Filed Nov. 8, 1973, Ser. No. 413,869

Claims priority, application Germany, Nov. 10, 1972, 2254990

Int. Cl. F16d *66/02*

U.S. Cl. 188—1 A **8 Claims**



1. A device for monitoring the thickness of a brake lining of a disc brake, having a disc with a brake shoe and lining on each side thereof, particularly in automotive vehicles provided with a power source, comprising:

two monitoring parts, a resistance and a slider;

an indicator of the thickness of the brake lining;

two telescoping members, mounted for relative axial movements one within the other externally of the said brake shoe and perpendicularly thereto;

a resilient protective sleeve surrounding the junction of said two telescoping members;

said resistance carried by one said telescoping member;

said slider carried by the other said telescopic member;

at least one of said two monitoring parts mounted in operative engagement with the outer side of said disc.

3,887,041

DISC BRAKES

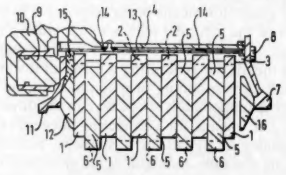
Denis Frederick Malone, Coventry, England, assignor to Dunlop Limited, London, England

Filed Dec. 18, 1973, Ser. No. 425,844

Claims priority, application United Kingdom, Dec. 19, 1972, 58655/72

Int. Cl. F16d *55/36*

U.S. Cl. 188—71.5 **4 Claims**



1. A multi-plate wheel disc brake comprising a number of annular stator discs axially slidably coupled with a non-rotatable torque-taking structure at their inner peripheries and interleaved with a number of annular rotor discs axially slidably coupled at their outer peripheries with the wheel, a brake-applying mechanism arranged to axially displace the discs into frictional engagement, the torque-taking structure comprising a torque tube having a plurality of longitudinally extending, circumferentially spaced keys and heat shield means between each adjacent pair of keys mounted in spaced relation to the torque tube, the inner peripheries of the stators being formed with circumferentially spaced keyways which respectively engage the keys of the torque tube, and the inner diameter of each stator between adajcent pairs of keyways being great enough to clear the heat shield means, said heat shield means between each adjacent pair of keys of the torque tube comprising an elongated strip of sheet metal which is secured to the torque-tube by heat-insulated mounting means adapted to maintain the heat shield in spaced relation to the torque tube and an annular air excluding member which in combination with the torque-taking structure and the remainder of the brake structure substantially eliminates the axial flow of air through the brake adjacent the inner periphery of the stators.

3,887,042

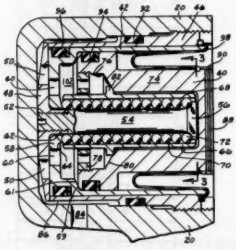
PISTON AND EXTENSIBLE CYLINDER THEREFOR

Richard J. Ditlinger; Richard W. Kerr, and Lyle E. Massing, all of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed July 22, 1974, Ser. No. 490,631

Int. Cl. F16d *65/52*

U.S. Cl. 188—71.8 **10 Claims**



1. Extensible fluid pressure actuated apparatus including a piston slidably carried in a cylinder for a multiple disc aircraft disc brake provided with fixed piston carrier means providing limited axial travel for the piston carried thereby, said fluid pressure actuated apparatus comprising:

a controlled source of pressurized fluid;

a fluid pressure responsive cylinder slidably carried in said carrier means and having an end wall;

a fluid pressure responsive piston slidably carried in said cylinder;

passage means communicating said cylinder and said piston with said pressurized fluid;

a fixed retaining member having an axially spaced apart relationship with said end wall and engageable therewith;

stop means including a plurality of spherical members arranged in column form and interposed between said fixed stop member and said end wall whereby the axial position of said end wall relative to said retaining member is dependent upon the number of spherical members in said column; and

means operatively connecting said piston and said stop means for displacing one or more of said spherical members from said column in response to axial movement of said piston away from said end wall to permit said cylinder to axially follow said piston under the influence of said pressurized fluid acting thereagainst.

3,887,043

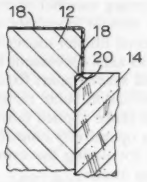
REPLACEMENT PADS FOR BRAKE ASSEMBLIES

Jack F. Hernick, Toronto, Ontario, Canada, assignor to Royal Industries, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 152,606, June 14, 1971, abandoned, which is a continuation-in-part of Ser. No. 794,214, June 1, 1969, abandoned. This application Apr. 17, 1973, Ser. No. 351,904

Int. Cl. F16d *65/02*

U.S. Cl. 188—73.1 1 Claim



1. In a motor vehicle having a disc brake assembly for frictional engagement with a rotor disc, the steps of:

installing an original set of brake pads in said disc brake assembly, each said pad having a friction surface engageable with a friction zone on said rotor disc bordered by inner and outer peripheries to which the edges of the original brake pad reach when it is in engagement with said friction zone;

operating said motor vehicle and the disc brake assembly over a period of time producing wearing of said brake pad and incrustations encroaching on said friction zone at its outer periphery, at least, thereby reducing the effective radial width of said friction zone below its original width;

replacing said worn original pad with a replacement pad corresponding in substantially all respects to the original pad with the exception that it is slanted at its outer edge to slightly diminish its effective friction surface by an amount sufficient to preclude its engagement with said incrustations and enable its friction surface to seat properly on said friction zone, the slant extending only over an initial portion of the thickness of the replacement pad to permit the friction surface to attain its desired dimensions by wearing away of the slanted portion in initial use of the replacement pad and leaving a substantial thickness of the pad with a friction surface of desired dimensions to be worn away in further use of the replacement pad.

3,887,044

SPOT-TYPE DISC BRAKE

Jochen Burgdorf, Offenbach, and Dieter Eikenberg, Frankfurt-Rodelheim, both of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Mar. 11, 1974, Ser. No. 450,034

Claims priority, application Germany, Mar. 20, 1973, 2313693

Int. Cl. F16d *69/04*

U.S. Cl. 188—73.5 8 Claims

1. An arrangement to support the brake shoes of a spot-type disc brake comprising:

a housing;

a caliper connected to said housing and embracing a brake disc;

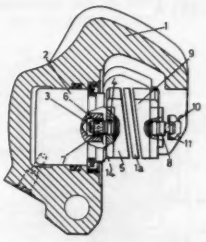
a brake actuation device disposed in said housing;

a first brake shoe associated with said actuation device;

a second brake shoe associated with said caliper remote from said actuation device;

a first supporting bolt secured to the middle zone of said first brake shoe having a given outer diameter;

a ring of elastic material disposed on an end of said first bolt adjacent said actuation device, said ring of elastic material having an outer diameter greater than said given outer diameter; and



a bore in said actuation device to receive said first bolt and said ring of elastic material, said first bolt being supported by said ring of elastic material under prestress in said bore.

3,887,045

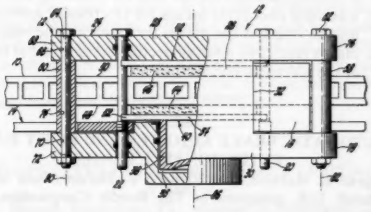
DISC BRAKE CALIPER ASSEMBLY AND METHOD

Edward J. DeHoff, Dayton, and Donald M. Flory, Arcanum, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 12, 1974, Ser. No. 460,375

Int. Cl. F16d *65/02*

U.S. Cl. 188—73.3 3 Claims



1. A disc brake assembly comprising:

a caliper housing of generally U-shaped cross section and having a bridge section and a pair of legs joined by said bridge section;

oppositely acting brake pad assemblies on said pair of legs;

a brake actuator associated with one of said brake pad assemblies and on one of said legs and movable when actuated to exert brake apply forces through said caliper housing and said brake pad assemblies tending to spread said legs;

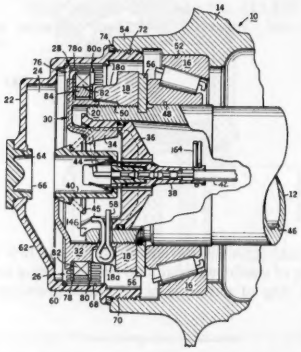
and spacer means for said pair of legs extending therebetween in compression preload and prestressing said caliper housing by holding said legs in substantially parallel relation, the amount of prestress forces being required to be taken up by actuation of said actuator before said brake apply forces exerted through said caliper housing act to tend to spread said legs beyond the spread thereof established by the compression preload of said spacer means, said spacer means acting in a plane extending transversely through said legs and said brake actuator and parallel to but spaced from said bridge section.

3,887,046

QUICK INSTALLATION VEHICLE WHEEL SENSOR

Richard C. Bueler, Des Peres, Mo., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed May 17, 1974, Ser. No. 470,947
Int. Cl. B60t *8/00*
U.S. Cl. 188—181 A **6 Claims**



1. In a vehicle wheel antilock system of the type including a wheel speed sensor, the sensor mounted on an axle adjacent at least one of the vehicle wheels, the sensor having a rotor and a stator and including a generally annular stator mounting ring carrying a first portion of a varying electrical signal generating means including a coil in cooperation with a second portion of the varying electrical signal generating means carried by the rotor, the improvement comprising:

a. means formed on the stator mounting ring for mounting the ring on the axle in a predetermined radial orientation;

b. means mounted on the axle for receiving the ring;

c. electrical connector means for electrically interconnecting the ring and the means for receiving the ring; and

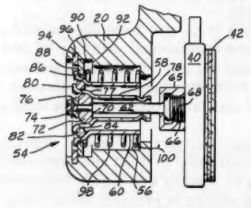
d. means resiliently interconnecting the ring and at least one of the electrical connectors.

3,887,047

AUTOMATIC BRAKE ADJUSTER AND RESET HAVING EXTENSIONABLE FEATURE

Eugene E. Harnish, and Richard F. Horner, both of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed Aug. 9, 1973, Ser. No. 387,093
Int. Cl. F16d *65/54*
U.S. Cl. 188—196 R **7 Claims**



1. Automatic brake adjusting and reset apparatus for a multiple disc disc brake having an axially movable fluid pressure actuated pressure plate for applying the brake comprising:

an annular housing provided with a plurality of circumferentially spaced-apart cavities;

a first radially deformable tubular member disposed in each of said cavities and provided with a stop member adjacent one end thereof;

a second radially deformable tubular member coaxial with said first tubular member and adapted to telescope relative thereto;

a support member fixedly secured to said pressure plate and extending therefrom into each of said cavities;

a first deforming member fixedly secured to said support member and frictionally engaged with said first tubular member for deforming the same in response to axial movement thereof;

a second deforming member interposed between said first and second tubular members and frictionally engaged with said second tubular member for deforming the same in response to axial movement therethrough;

first and second spaced-apart fixed stop means engageable with said second tubular member and defining brake released and brake applied positions thereof;

resilient means operatively connected to said second tubular member for urging the same into engagement with said first stop means;

said first and second tubular members being actuated by said pressure plate in response to pressurization of the latter to apply the brake;

said second tubular member engaging said second stop means to prevent subsequent movement of said first and second tubular members whereupon said first deforming member is urged axially through said first tubular member to the extent permitted by said stop member to progressively compensate for wear of the frictional surfaces of said multiple discs;

said second deforming member being urged axially through said second tubular member by said first tubular member following engagement of said first deforming member with said stop member to extend the range of adjustment of said pressure plate beyond that provided by said first tubular member;

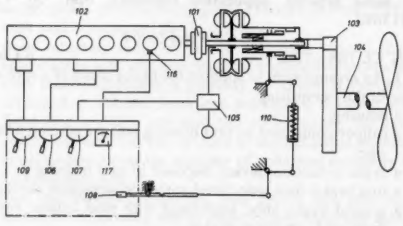
said resilient means urging said second tubular member off said second stop means into engagement with said first stop means to thereby establish a predetermined brake running clearance upon depressurization of said pressure plate and release of said brake.

3,887,048

SHIP'S PROPULSION PLANT

Ernst Jahnel, Augsburg; Erich John, Gersthofen, both of Germany, and Harold Sinclair, Folkestone, England, assignors to Messrs. Zahnraderfabrik Renk Aktiengesellschaft, Augsburg, DT

Filed Sept. 25, 1973, Ser. No. 400,661
Claims priority, application Germany, Sept. 29, 1972, 2247964
Int. Cl. F16d *39/00, 9/00*
U.S. Cl. 192—3.28 **18 Claims**



1. A ship's propulsion plant comprising:

a propulsion engine;

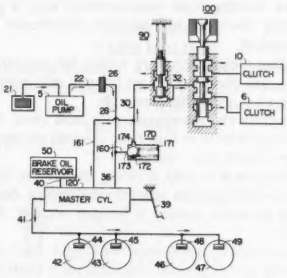
a drive shaft connected to said engine;
a propeller;
a driven shaft coupled to said propeller;
a variable-filling hydrodynamic coupling having an impeller and a turbine wheel, said impeller being rigidly connected to said drive shaft and said turbine wheel being rigidly connected to said driven shaft;
a selectively engageable mechanical coupling to by-pass said hydrodynamic coupling to connect said drive shaft to said driven shaft; and
control means for setting the power of said engine, for setting the filling of said hydrodynamic coupling and for shifting said by-pass coupling;
wherein said by-pass coupling comprises:
a one-way safety coupling element; and
means for directly transmitting propulsion torque of said engine to said propeller and for automatically disengaging said one-way safety coupling element when reverse torque between said engine and said propeller exceeds a predetermined limiting value.

3,887,049

HYDRAULIC CONTROLS FOR TRANSMISSION AND BRAKE SYSTEMS WITH PRESSURE BOOSTER

Shin Ito, and Hiroshi Kawaguchi, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 182,736, Sept. 22, 1971, Pat. No. 3,774,734. This application Mar. 15, 1973, Ser. No. 341,485
Claims priority, application Japan, Sept. 24, 1970, 45-82979
Int. Cl. B60k *29/00*
U.S. Cl. 192—4 A **3 Claims**



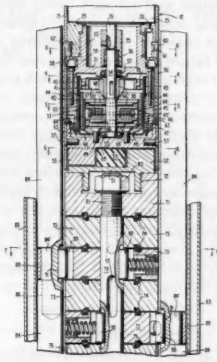
1. In a hydraulic brake control system having a control circuit connected to a transmission and to a brake system in a vehicle including a transmission, brake means for said vehicle, wheel cylinder means for actuating said brake means, and a brake pedal movable between a first and a second position for applying a braking force to said system, the combination comprising master cylinder means in hydraulic communication with said wheel cylinder means for converting force applied through said brake pedal into a corresponding hydraulic pressure, means responsive to movement of said brake pedal for doubling the hydraulic pressure in dependence upon the position of said brake pedal, means for effecting speed change in said transmission, a hydraulic pressure source, a hydraulic pump connected to said hydraulic pressure source, and connecting means extending between said pump and both said means for effecting a speed change and said means for doubling said hydraulic pressure for supplying doubled hydraulic pressure from said pump to each of said means, said connecting means comprising a first passage for connecting said oil pump directly to said master cylinder, a second passage for connecting said speed change means to said first passage, a relief valve positioned in said second passage, and a third passage connected between said master cylinder means and said second passage bypassing said relief passage.

3,887,050

GEARING WITH CENTRIFUGAL BRAKE FOR REVOLVING DOOR

Amuel E. Sheckells, Evansville, Ind., assignor to International Steel Company, Evansville, Ind.

Division of Ser. No. 210,385, Dec. 21, 1971, Pat. No. 3,766,686. This application Apr. 5, 1973, Ser. No. 348,307
Int. Cl. E05d *15/02*
U.S. Cl. 192—4 R **8 Claims**



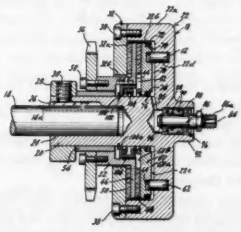
1. A speed control device for a revolving door, said door having fixed and rotational mounting parts, said device comprising a rotational speed change unit including a gear anchored to one of said mounting parts, a coacting deflectable gear attached to the other mounting part and positioned to engage the first-named gear, an eccentric operator for said deflectable gear and creating a traveling deflection wave around the deflectable gear to thereby induce relative rotation between the deflectable and first-named gears, and a centrifugal force actuated brake means driven by said eccentric operator and serving when active to arrest relative rotation between said fixed and rotational mounting parts.

3,887,051

FLUID-OPERATED CLUTCH WITH WEAR LIMITING STOP

Fred A. Bignell, Emporium, Pa., assignor to Emporium Specialties Co., Inc., Austin, Pa.

Filed Mar. 20, 1974, Ser. No. 452,932
Int. Cl. F16d *25/00*
U.S. Cl. 192—85 AA **5 Claims**



1. A fluid-operated clutch comprising a clutch housing including an elongated central hub, a facing plate and a backing plate spaced from and coaxial with said facing plate to form an internal cavity within said clutch housing, a driving

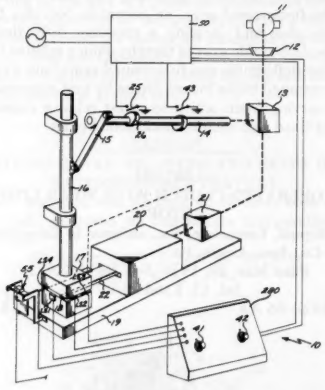
clutch plate positioned within said internal cavity and about said central hub, coupling means mounting said driving clutch plate for rotation with said clutch housing and for axial movement toward and away from said facing plate, said driving clutch plate and said facing plate forming a variable volume chamber with said central hub, a driven assembly positioned between said driving clutch plate and said backing plate and mounted for rotation on said central hub, said driven assembly including a driven clutch plate having friction means thereon for driving said driven clutch plate when said driving clutch plate is moved away from said facing plate into operative engagement with said driven clutch plate, a cup-shaped member disposed within said internal cavity between said driven assembly and said central hub, a return spring disposed within said cup-shaped member and surrounding said central hub, one end of said return spring engaging one face of said driving clutch plate for urging said driving clutch plate out of engagement with said driven assembly, means axially fixing said cup-shaped member relative to said central hub, said cup-shaped member including means being constructed and arranged for preventing contact between said driving clutch plate and said driven clutch plate when said friction means wears out, passage means in said clutch housing for the entry of fluid into said chamber to increase the volume thereof for moving said driving clutch plate into engagement with said driven assembly, and rotatable fluid coupling means connected to said clutch housing at said passage means for delivering a supply of fluid to said chamber to operate said clutch.

3,887,052

MACHINE TOOL MONITORING UNIT

Gordon P. Del Faro, 23529 Dolorosa, Woodland Hills, Calif. 91364, and Eugene E. Valentine, 11557 Dellmont Dr., Tujunga, Calif. 91042

Filed Nov. 7, 1973, Ser. No. 413,586
Int. Cl. F16p *3/20;* **B65h** *63/06*
U.S. Cl. 192—127 **14 Claims**



1. An electrical monitoring and control unit for monitoring and controlling the operation of a cyclic machine tool, comprising, in combination:

first sensing means adapted to register selected cyclic events of the machine tool for producing first switching signals indicative thereof;

gating means connected to receive said first switching signals in predetermined combination for producing a gated output signal indicative of the status of any one or more of selected ones of said first switching signals when selected other ones thereof are in a predetermined status;

second sensing means adapted to register selected projections in said machine tool for producing second switching signals indicative thereof; and

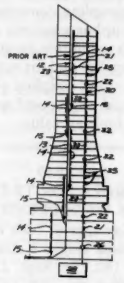
main switching means connected for receiving said gated output signal and said second switching signals for effecting a machine shut down concurrent with the receipt of either one thereof.

3,887,053

GRAVITY CHUTE SYSTEMS

Peter H. Luiten, Monrovia, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Filed Nov. 2, 1973, Ser. No. 412,360
Int. Cl. B65g *11/00;* **E04f** *17/12*
U.S. Cl. 193—34 **10 Claims**



1. In a gravity chute system for conveying deposited objects, the improvement comprising in combination:

a substantially vertical riser conduit;

means for dividing said riser conduit into a plurality of stationary riser conduit sections distributed along said riser conduit;

said dividing means including means for essentially closing each of said riser conduit sections in one position against passage of objects therethrough;

means operatively associated with said riser conduit for depositing objects in said riser conduit sections from the outside of said riser conduit;

means connected to said dividing means for opening said riser conduit sections whereby to permit deposited objects to proceed toward a bottom section of said riser conduit;

means operatively associated with said riser conduit for removing said deposited objects from a bottom region of said riser conduit; and

means for venting each of said closed riser conduit sections.

3,887,054

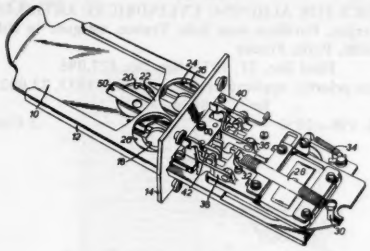
COIN SLIDE MECHANISM

Kenneth Rinaldo Allen, Woodford, England, assignor to Essex Engineering Works (Wanstead) Limited, London, England

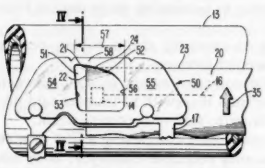
Filed Nov. 2, 1973, Ser. No. 412,449
Claims priority, application United Kingdom, Nov. 12, 1972, 52841/72
Int. Cl. G07f *5/06*
U.S. Cl. 194—92 **9 Claims**

1. A coin slide mechanism comprising a guide track, mounting means for securing said guide track generally horizontally to a wall, a coin slide having first, second and third apertures therein and mounted slidably in said guide track for movement between extended and fully depressed positions, said coin slide being normally biased to said extended position in which said apertures are exposed for receiving respective coins resting flat on said guide track, and said first and second apertures being disposed side by side adjacent said mounting means on opposite sides of a center line of said coin slide and said third aperture being disposed further from said mounting means than said first and second apertures and overlapping said center line when said coin slide is in said extended posi-

tion, full stroke ratchet means for ensuring that the coin slide cannot be returned to its extended position from a partially depressed position without completing its stroke once the ratchet means is engaged, and coin testing means for preventing depression of the coin slide from said extended position to said fully depressed position at least if one or more of said apertures is empty, said guide track extending to support coins in said apertures during movement of said coin slide substantially to said fully depressed position and then to allow said coins to drop out of said coin slide, said coin testing means including first and second levers disposed and resiliently biased to engage edge regions of the faces of coins of sufficient size in said first and second apertures and to prevent continued depression of said coin slide with a coin of insufficient size in at least one of said first and second apertures, said levers being disposed and arranged to apply a force to a coin in said third aperture for ejecting the coin from said third aperture.



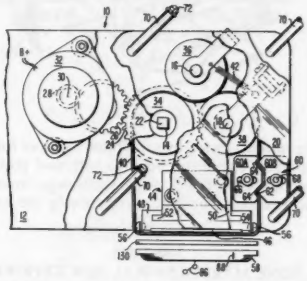
3,887,055
CARD HOLDER
Benjamin George Pastrick, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 13, 1973, Ser. No. 424,500
Int. Cl. B41j *13/12*
U.S. Cl. 197—135 R **5 Claims**



1. A printer including print forming mechanism, and a writing sheet support platen, said print forming mechanism and said platen defining a printing point and writing line therebetween, means for feeding a writing sheet into operative interposition between said print forming mechanism and said platen in a paper feed direction that is normal to said writing line, and means for holding the writing sheet against said platen at said printing point comprising: a plate-like body, means supporting said plate-like body adjacent said platen at said printing point, said plate-like body comprising a pair of side portions that extend in said paper feed direction and are spaced laterally on opposite sides of said printing point, and an upper bridging portion positioned above said printing point and interconnecting said side portions, said side and upper bridging portions thereby respectively defining side and upper edges of an open portion through which said print forming mechanism is enabled to have print cooperation with the writing sheet supported by said platen, said plate-like body being configured to urge the writing sheet into close adjacency with said platen at said printing point; wherein the improvement comprises:

said upper bridging portion of said plate-like body defining an upper camming edge of said open portion that extends transverse to said paper feed direction at a unidirectional angle other than substantially 90° throughout the entire space between said side portions.

3,887,056
DEMOUNTABLE-PLUGGABLE TENSIONING AND RE-INKING RIBBON CARTRIDGE
Jerry Hans Lehmann, Rochester, N.Y., assignor to Burroughs Corporation, Detroit, Mich.
Filed Mar. 23, 1973, Ser. No. 344,268
Int. Cl. B41j *33/10*
U.S. Cl. 197—168 **10 Claims**



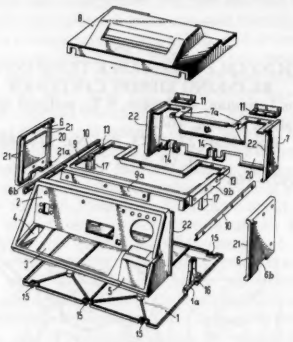
1. A demountable continuous re-inking ribbon cartridge comprising:
a base support member,
a signature plate holder including means demountably receiving a signature plate having an impression producing area thereon operably associated therewith so that said signature plate can be replaced at will,
a continuous ribbon for inking said signature plate,
means for continuously inking said ribbon, said inking means being physically arranged to entrap said ribbon constraining the ribbon against lateral movement, and
braking means for said ribbon, including means for maintaining said ribbon in taut condition over the impression producing area of said signature plate whereby said ribbon is caused to weave back and forth prior to entering the impression producing area effectively regulating the tautness of the ribbon.

3,887,057
HOUSING FOR ELECTRICALLY OPERATED TYPEWRITERS AND SIMILAR MACHINES
Horst Stahl, Weidach; Guenther Vorbach, Schwindegg Upper BarViria; Erich Brunnthaler; Wolfgang Hezel, both of Wolfratshausen, and Wolfgang Flath, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed Aug. 22, 1973, Ser. No. 390,394
Claims priority, application Germany, Aug. 30, 1972, 2242569
Int. Cl. B41j *29/08*
U.S. Cl. 197—186 B **14 Claims**

1. In a housing for apparatus which may require servicing, such as electrically operated typewriters and similar machines of which telex machines are an example:
base means for supporting thereon apparatus to be housed;
a housing shell comprising upright wall members including a front wall member, a rear wall member, and two opposite side wall members;
a generally ring-shaped frame member;

means securing upper end portions of all of said wall members to said frame member;

supporting post means extending upwardly from opposite sides of said base means; and



coupling means carried by said frame member for engaging in separable supporting relation with said post means to permit lifting of the housing shell away from the base means to expose apparatus supported by the base means.

3,887,058

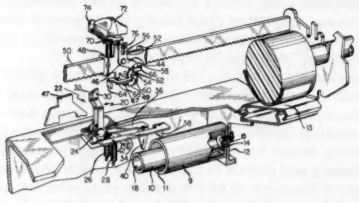
DUAL TONE MARGIN SIGNAL FOR TYPEWRITERS

Ernest F. Lohr, Homer, N.Y., assignor to SCM Corporation, New York, N.Y.

Filed Dec. 3, 1973, Ser. No. 421,198

Int. Cl. B41j *29/46*

U.S. Cl. 197—192 **3 Claims**



1. An audible signal mechanism for indicating the end of a line-of-write in a typewriter having a frame including an abutment and a carriage supported on the frame and movable relative to the frame, a carriage rack fixed on the movable carriage and a margin stop adjustably supported on the carriage and movable relative to the carriage comprising:

an actuator assembly pivotally supported about a first pivot on the margin stop including an adjustment lever pivotally supported on a knob of the margin stop and an adjustable actuator coupled to said adjustment lever by a motion transmitting means therebetween;

a pair of L-shaped actuable members pivotally supported about a second pivot on the frame comprising, a plurality of rigid arms extending upwards of said second pivot into the path of said actuator for engagement and disengagement by said actuator when said actuator traverses the frame, a plurality of flexible arms terminating in a plurality of hammer members and extending laterally of said second pivot for contacting the frame abutment and deflecting beyond the frame abutment when said rigid arms are engaged and disengaged by said actuator; and

a first resonating element horizontally supported on the frame and a second resonating element co-axially supported within said first resonating element with a portion of said second resonating element projecting from said first resonating element, said resonating elements positioned below said hammer members for sequentially striking by said hammer members for effecting a plurality of sequential audible signals for indicating the end of line-of write.

3,887,059

DEVICE FOR ALIGNING CYLINDRICAL ARTICLES

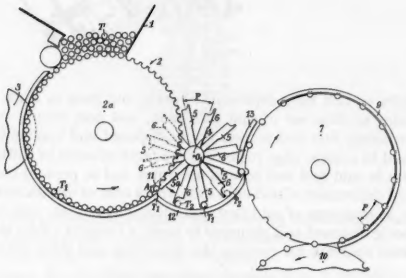
Jean Verjux, Pavillons sous Bois, France, assignor to Usines Decoufle, Paris, France

Filed Dec. 21, 1973, Ser. No. 427,095

Claims priority, application France, Jan. 4, 1973, 73.00228

Int. Cl. B65g *47/00*

U.S. Cl. 198—20 C **3 Claims**



1. Device for aligning sections of cylindrical articles, particularly double-length filter tips in the form of plugs, for cigarette manufacturing comprising

a source of filter tip supply units;

a rotatable cutting drum having peripherally equal spaced first grooves to receive the plugs therein from said supply source;

a rotatable re-centering drum having peripherally equal spaced second grooves;

intermediate conveyor means located between said drums and associated therewith to transfer said plugs from said cutting drum to said re-centering drum;

said conveyor means comprising a first rotatable conveyor and a second rotatable conveyor, both said conveyors being mounted on a common axis and having the same speed of rotation;

said first conveyor comprising a plurality of first equal-sized radially extending equal-angularly spaced arms, each arm having a first notch formed at its outer end and adapted to remove an individual plug from a first groove in said cutting drum for transfer to a second groove in said re-centering drum;

said second conveyor comprising a plurality of second equal-sized radially extending equal-angularly spaced arms, each second arm having a second notch formed at its outer end and adapted to remove an adjacent individual plug from said first groove in said cutting drum for transfer to a following second groove in said re-centering drum;

said plurality of second arms being individually angularly spaced with respect to said first arms so that any individual arm on one said conveyor is located midway between two individual adjacent arms of the other said conveyor; the outer diameters of said arms of said first and second conveyors being equal; and

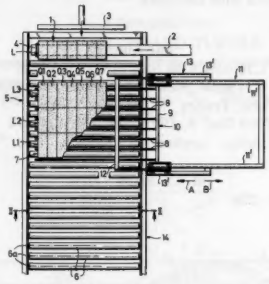
said second notches of said second arms extending further radially inwardly than said first notches of said first arms.

3,887,060

APPARATUS AND METHODS FOR FORMING ROWS OF SELECTIVELY SPACED ARTICLES

Hermann Kamhues, Laggenbeck, Germany, assignor to C. Keller u. Co., Laggenbeck, Germany

Filed Mar. 7, 1974, Ser. No. 448,830
Claims priority, application Germany, Mar. 15, 1973, 2312946
Int. Cl. B65g 47/32
U.S. Cl. 198—30 15 Claims



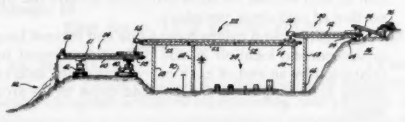
6. Apparatus for forming at least one row of articles wherein selected articles are selectively spaced from one another, said apparatus comprising a support; means for assembling a plurality of articles on said support closely adjacent one another in a longitudinally extending row; carrier means for lifting a selected number of said articles off said support; means mounting said carrier means and the articles carried thereby for movement along a path extending in a direction longitudinally of said row; stop means occupying a position in the path of movement of the articles carried by said carrier means; and means mounting said stop means for conjoint movement with and at the same speed of said carrier means in said direction and for movement relative to said carrier means for selected periods of time in the opposite direction for interrupting movement of the articles carried by said carrier means, the interruption of movement of articles carried by said carrier means effecting discharge of a selected number of said articles from said carrier means in a row and the time intervals between successive periods of such interruption establishing a selected spacing between successive articles discharged from said carrier means.

3,887,061

PORTABLE MODULAR MATERIALS DISTRIBUTION SYSTEM

Henry R. Hopkins, 7201 92nd St. S.E., Mercer island, Wash. 98040

Filed Aug. 3, 1972, Ser. No. 277,818
Int. Cl. B65g 65/28
U.S. Cl. 198—36 14 Claims



12. A modular conveyor trestle section comprising:

a plurality of rectangular trusses of substantially equal lengths having their elongate sides joined together, each end of the trestle section lying substantially in a plane perendicular to the plane of said trusses and having a rectangular shape, coupling means affixed to each end of said trestle section, said coupling means being of a first type on a given corner and being of an opposite type at the corresponding longitudinally opposite end corner, coupling means of said first type being located on one set of diagonal corners at both ends of said section and coupling means of said opposite type being located on the other set of diagonal corners at both ends of said trestle section, said coupling means of said first type capable of mating with coupling means of said opposite type to join together end to end a plurality of said trestle sections to form an integrated conveyor trestle,

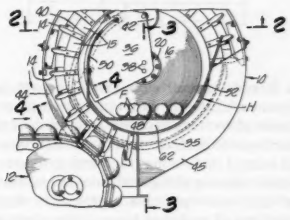
a plurality of belt-supporting roller means mounted on one side of trestle section.

3,887,062

SIDE ENTRY HOPPER FOR ROTARY FRUIT FEEDER

Ronald C. Bushman, Hacienda Heights, Calif., assignor to Brown International Corporation, Covina, Calif.

Filed Feb. 26, 1973, Ser. No. 336,031
Int. Cl. B65g 47/18
U.S. Cl. 198—52 6 Claims



1. In a fruit processing apparatus wherein a side entry hopper supplies fruit of generally spherical configuration to an open side of an upright rotary fruit feeder that has a circumferential series of pockets which are open from above as they pass through the bottom portion of their circular orbit;

the improvement comprising:

the bottom of the hopper being in the form of a substantially flat surfaced ramp inclined downward towards said bottom portion of the circular orbit to cause the fruit to roll gravitationally down the ramp towards the pockets,

a terminal portion of the ramp dropping off and conforming to the arcuate path of the pockets to urge fruit gravitationally into the individual pockets as the pockets pass through the bottom of the circular orbit;

said terminal portion of the ramp having the configuration of a concave surface of a portion of a cone having its lower edge conforming to the curvature of said bottom portion of the circular orbit.

3,887,063

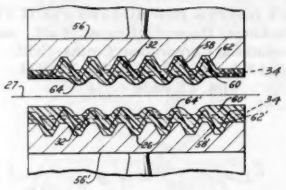
CONVEYOR APPARATUS

Juan T. Villanueva, and Jesus T. Villanueva, 150 Apo St., Sta Mesa Hgts., both of Quezon City, Philippines

Continuation-in-part of Ser. No. 830,449, Jan. 4, 1969, Pat. No. 3,670,366. This application June 1, 1972, Ser. No. 258,875
Claims priority, application Philippines, June 4, 1968, 9282
Int. Cl. B65g 15/14
U.S. Cl. 198—165 10 Claims

1. A conveyor arrangement, comprising, in combination, a first endless conveyor arrangement comprising first elongated endless conveyor means having a first run; and a second endless conveyor arrangement comprising second elongated endless conveyor means having a second run adjoining said first run, the facing surfaces of said first and second runs defining together an elongated path for fibrous material to be transported gripped between said first and second runs oriented in direction transverse to the elongation of said first and second

runs, said surface of said first run having a first undulating transverse cross-sectional configuration, and said first elongated endless conveyor means being comprised of a plurality of parallel endless flexible first elongated conveyor sections spaced apart from each other in direction transverse to the elongation of said first sections to define a plurality of elongated parallel first spaces and to impart to said surface of said first run said first undulating transverse cross-sectional configuration, and said surface of said second run having a second undulating transverse cross-section configuration exactly complementary to said first undulating transverse cross-sectional configuration, and said second elongated endless conveyor means being comprised of a plurality of parallel



endless flexible second elongated conveyor sections spaced apart from each other in direction transverse to the elongation of said second sections to define a plurality of elongated parallel second spaced and to impart to said surface of said second run said second undulating transverse cross-sectional configuration, and wherein along said first and second runs said sections of each conveyor means project in direction from the respective one of said runs towards the other one of said runs and into respective ones of the plurality of elongated parallel spaces of the other one of said conveyor means, with said surfaces of said first and second runs mating uniformly in transverse direction due to the exactly complementary undulating transverse cross-sectional configurations of said surfaces of said first and second runs.

3,887,064

WALKING BEAM CONVEYOR IN A FURNACE

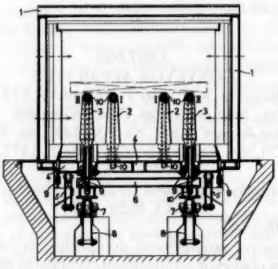
Heinz Brockmann, Duesseldorf, Germany, assignor to Brodu Industrie-Ofenbau GmbH & Co. KG, Duesseldorf, Germany

Filed Oct. 26, 1973, Ser. No. 410,238

Claims priority, application Germany, Oct. 30, 1972, 2253105

Int. Cl. F27b *9/14*

U.S. Cl. 198—219 **4 Claims**



1. In a heat tunnel having a walking beam conveyor arrangement for transporting work through said heat tunnel in a horizontal feed direction wherein the conveyor arrangement comprises, in combination, a first vertically reciprocable work-supporting beam, a second horizontally reciprocable work-supporting beam, each of the first and second beams having a substantially horizontal work-contacting surface, and actuating means for relatively moving the first and second beams in timed relation in alternate engagement with the work to advance the work through the heat tunnel, the improvement wherein the second beam is provided with facilities for vertical reciprocation to a height chosen such that the uppermost position of its work-supporting surface is substantially level with the uppermost position of the work-supporting surface of the first beam, and wherein the actuating means includes facilities for maintaining the work-supporting surface of each of the first and second beams in its uppermost position when in contact with the work.

3,887,065

CIGARETTE SETTING DEVICE

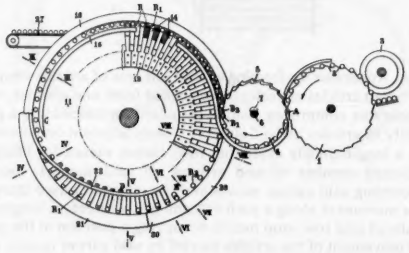
Jean Verjux, Pavillons Sous Bois, France, assignor to Usines Decoufle, Paris, France

Filed Dec. 3, 1973, Ser. No. 421,271

Claims priority, application France, Dec. 27, 1972, 72.46423

Int. Cl. B65g *47/24*

U.S. Cl. 198—280 **3 Claims**



1. Device for turning over cigarettes when they are parallelly spaced and proceeding in a continuous row comprising

rotary supply means for the cigarettes;

a rotating circular drum in close association with said rotary supply means to receive the cigarettes therefrom;

said drum having a horizontally extending shaft to provide for rotation of said drum in a vertical plane, said drum including a plurality of cavity means equally spaced around the periphery of said drum, each side cavity means adapted to receive a respective cigarette therein delivered from said supply means;

fixed internal and external circular means located along said drum periphery to define sliding support and guide means for the cigarettes in said cavity means as the cigarettes move along said drum periphery;

said circular guide means being in contact with the cigarettes from a first location on said drum periphery where cigarettes are delivered to said drum to a second location on said drum periphery, said drum periphery providing a path of movement for the cigarettes from said first location to said second location extending around the upper portion of said drum periphery;

fixed elongated ramp means having one end thereof located at said second location in said path of movement to be contacted by an end of each moving cigarette, said ramp means extending inwardly into said drum in an arcuate shape;

additional external circular guide means extending along said drum periphery from said second location to support the other end of each moving cigarette when the cigarette is in contact with said ramp means;

said one end of said ramp means located on one side of said additional external guide means, and said ramp means extending smoothly adjacent the lower portion of said drum periphery from its one end to its other end, said

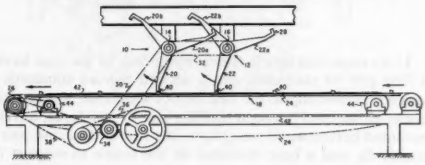
other end of said ramp means being positioned at a third location on the other side of said additional external guide means whereby the one end of each cigarette as it moves in contact with said ramp means is lifted from said cavity means and rotated inwardly toward said shaft and then rotated further so that the one end of each cigarette has been rotated 180° at said third location and repositioned in said cavity means; and

conveyor means to receive the turned cigarettes from said cavity means.

3,887,066
AUTOMATIC BOARD TURNER

Hendrik Houtsager, Beaverton, Oreg., assignor to Moore Dry Kiln Company of Oregon, Portland, Oreg.

Filed July 20, 1973, Ser. No. 380,997
Int. Cl. B65g *47/24*
U.S. Cl. 198—285 **16 Claims**



1. A method of advancing boards transversely at spaced intervals and automatically inverting said boards to permit inspection of both sides thereof, said method comprising:

a. advancing said boards on a conveyor having respective projecting lugs regularly spaced along its line of travel for engaging and positioning the leading edges of said respective boards;

b. rotating an arm about an axis positioned above and transverse to the direction of travel of said conveyor, said arm being adaptable when depending from said axis adjacent the bottom of its arcuate path to engage the leading edge of a respective one of said advancing boards and lift said edge with a tipping motion tending to invert said board backwardly away from a respective lug as said arm rotates forwardly and upwardly; and

c. frictionally urging said board forward on said conveyor by means of a speed-up belt underlying said conveyor and traveling in the same direction but at a greater linear speed than said lugs, thereby maintaining the engagement between said board and said arm until said board has been completely inverted and thereafter accelerating said inverted board forwardly into engagement with said respective lug.

3,887,067
PACKAGE

Peter C. Collura, Los Altos, Calif., and Michael A. Kipp, Glen Ridge, N.J., assignors to Container Corporation of America, Chicago, Ill.

Filed Jan. 2, 1973, Ser. No. 319,973
Int. Cl. B65d *5/50*
U.S. Cl. 206—45.14 **1 Claim**

1. An open ended package for displaying and retaining a generally elongated article of merchandise, said package being formed from a cut and scored blank of paperboard or the like, comprising:

a. interconnected closing, end, backing, and cradling panels and a pair of closing flaps having article exposing apertures;

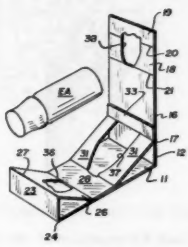
b. said article cradling panels including:

i. first, second and third panel elements wherein said second and third elements have article receiving apertures;

ii. an attaching panel element;

c. a securing flap foldably joined to said third panel element;

d. said attaching panel element being secured to the top side of said backing panel, said securing flap being attached to the underside of said closing panel, and one of said closing flaps being secured to the top side of said second cradling panel element;



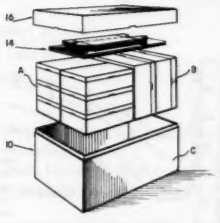
e. said first cradling panel element being positioned in substantially vertical position between said backing panel and said second cradling panel element with said second cradling panel element being inclined downwardly toward said attaching panel;

f. said third cradling panel element being inclined from said attaching panel upwardly toward said closing panel and being foldably joined to said securing flap which is attached to the underside of said closing panel.

3,887,068
MODULAR MAILING CONTAINER SYSTEM AND PROCESS

Paul Noel Ghione, Box 111, Station A, Berkeley, Calif. 94702

Filed Aug. 20, 1973, Ser. No. 390,067
Int. Cl. B65d *71/00*
U.S. Cl. 206—223 **20 Claims**

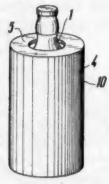


1. A mailing container system, or kit, comprising a plurality of self-sealing, plastic modules defining no more than three different predetermined sizes and shapes and a plurality of folding cartons, each of said cartons configured to correspond to and receive one of said modules to form a complete mailing container ready for mailing; each of said modules having a lid and a base, the walls thereof defining a rectangular and cross-sectional configuration with each external and internal surface of each module lying in a single plane; a plurality of at least one of said modules adapted to be disposed within at least one other of said modules together with the corresponding folding cartons thereof to form said kit.

3,887,069
DOUBLE FLASK FOR THE RECEPTION OF TWO LIQUIDS

Manfred Diwo, 16a Waldstrasse 5511, Wellen, Germany

Filed July 2, 1973, Ser. No. 375,356
Claims priority, application Luxembourg, July 17, 1972, 65740
Int. Cl. B65d 11/16, 21/00
U.S. Cl. 206—229 3 Claims

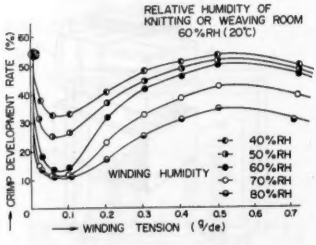


1. A double flask for reception of two different liquids, such as whisky and mineral water, soda water or another spirit that is to be mixed with water, comprising an inner body having an upper slender body portion, an enlarged lower body portion of a diameter greater than the diameter of the slender body portion and a shoulder portion connecting said upper and lower body portions, an annular container disposable around said inner bottle slender body portion and having foil cap sealing means and encircling label means connecting said annular container and said inner bottle lower body portion for maintaining said inner bottle and said annular container in integrated relationship.

3,887,070
PACKAGE OF CRIMPED THERMOPLASTIC SYNTHETIC YARNS AND METHOD OF WINDING UP SAME

Koji Tajiri; Fumio Nagatoshi, and Masateru Terano, all of Mihara, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Sept. 14, 1973, Ser. No. 397,358
Claims priority, application Japan, Sept. 18, 1972, 47-92847; Nov. 1, 1972, 47-10879
Int. Cl. B65d 65/16, 85/04
U.S. Cl. 206—392 6 Claims

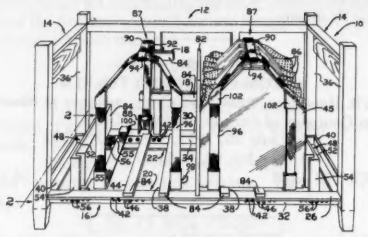


1. A package of a crimped yarn of thermoplastic synthetic fibers, said package either being one having a winding hardness of above 70° when the moisture content of the yarn at the inner layered portion of the package is less than the equilibrium moisture content at the relative humidity of the atmosphere to be used at the time of the knitting or weaving operation or being one having a winding hardness of less than 70° when the moisture content of the yarn at the inner layered portion of the package is greater than the equilibrium moisture content at the relative humidity of the atmosphere to be used at the time of the knitting or weaving operation.

3,887,071
ARTICLE TRANSPORTING RACK

Ronald J. Thomaswick, Kittanning, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed June 29, 1973, Ser. No. 375,197
Int. Cl. B65d 85/48
U.S. Cl. 206—454 10 Claims



1. An improved article transporting rack of the type having a first pair of standards and a second pair of standards in spaced relationship to the first pair of standards; a supporting backwall secured between the first pair of standards; a frame mounted between and attached to the first and second pair of standards; and a base mounted on the frame to support the articles, the improvement comprising:

the frame comprising:

a pair of solid, rigid members each having a vertical leg and a horizontal leg, a one of said rigid members secured to the first pair of standards with the horizontal leg extended toward the second pair of standards and the vertical leg extended upward and the other one of said rigid members secured to the second pair of standards with the horizontal leg extended toward the first pair of standards and the vertical leg extended upward;

the horizontal leg of each of said solid rigid members supports the base in a horizontal plane;

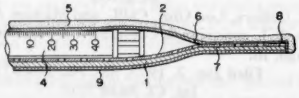
the vertical leg of each of said solid members prevents movement of the base toward and away from the back wall; and

means attached to the frame for securing the articles on the rack.

3,887,072
PACKAGE

Norio Koremura, Fujinomiya, Japan, assignor to Jintan Terumo Co., Ltd., Tokyo, Japan

Filed June 27, 1973, Ser. No. 373,935
Claims priority, application Japan, June 30, 1972, 47-65485
Int. Cl. B65d 73/00
U.S. Cl. 206—484 7 Claims



1. A package for an article such as surgical instrument, comprising first and second sheets enclosing an article therebetween, said first sheet comprising a paper layer and a thermosetting plastics layer thereon, said thermosetting plastics layer extending over a peripheral portion of said paper layer and having a plurality of cutouts therein exposing underlying areas of said paper layer, and said second sheet comprising a layer of thermoplastic material, wherein said thermosetting layer on said peripheral portion of said first sheet is in contact with a peripheral portion of said thermoplastic material layer of said second sheet, said thermoplastic material of said sec-

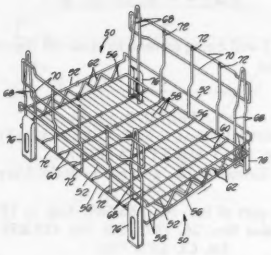
ond sheet extending through said cutouts in said thermosetting plastics layer and being bonded to said exposed underlying areas of said paper layer.

3,887,073

NESTABLE-STACKABLE RECEPTACLE

James D. Wilson, Newport Beach, Calif., assignor to Banner Metals, Inc., Compton, Calif.

Filed June 11, 1973, Ser. No. 368,745
Int. Cl. B65d 21/04
U.S. Cl. 206—507 2 Claims



1. A receptacle capable of being stacked or nested with receptacles of like construction, including: a first wire rod extending as a closed rectangular loop around the periphery of the receptacle, said closed rectangular loop having spaced and parallel side portions, having spaced and parallel end portions, and having four corners; means attached to said wire rod to define a bottom for the receptacle; and further wire rods forming elongated side brackets attached to said wire rod at the respective corners of the rectangular loop, said side brackets extending upwardly to define corresponding upper support members displaced downwardly from the plane of the bottom of the receptacle and extending downwardly to define corresponding lower support members displaced downwardly from the plane of the bottom and in respective vertical alignment with the upper support members, each of said further wire rods defining an inverted U-shape to provide an apex at the upper end of the corresponding side bracket, and each of the further rods being formed with the lower end thereof configured into a bent-over looped end portion.

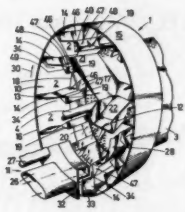
3,887,074

APPARATUS FOR CONTINUOUSLY SEPARATING AND DISCHARGING HEAVY FOREIGN MATTERS FROM BEETS

Andre Henri Bausier, St. Jean Geest, Belgium, assignor to Raffinerie Tirlemontoise, Brussels, Belgium

Filed Oct. 1, 1974, Ser. No. 510,968
Claims priority, application Belgium, Nov. 12, 1973, 807191
Int. Cl. B03b 3/34
U.S. Cl. 209—158 13 Claims

1. Apparatus for separating and discharging continuously heavy foreign matter from beets or similar articles which are conveyed by floating inside a trough, which comprises at a break in the trough, a pocket lying below the trough level and means for generating a rising liquid stream inside said pocket, said pocket comprising one of the pockets on a rotating wheel with pockets distributed over the internal circumference thereof, said wheel rotating in front of said means for generating which comprises at least one means for supplying the pockets with a rising liquid stream, arranged on the lower portion of the wheel path, the pockets being provided with an outlet passageway for the rising liquid stream directed inside the wheel, the apparatus comprising moreover a means for recovering and discharging foreign matter from the wheel,



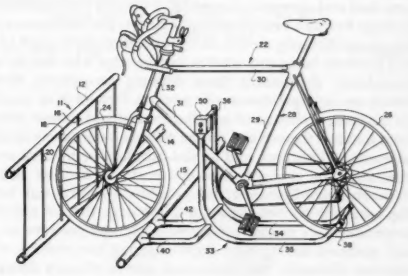
said device being arranged underneath the upper portion of the wheel path.

3,887,075

BICYCLE RACK

Jack E. Harvey, 1521 N. High St., Columbus, Ohio 432201

Filed Aug. 9, 1973, Ser. No. 387,163
Int. Cl. E05b 73/00; A47f 7/00
U.S. Cl. 211—5 8 Claims



1. A system for supporting and securing a plurality of bicycles comprising in combination:

at least one bicycle rack, having at least one space of a size suitable to receive one bicycle, there being a plurality of spaces overall;

means comprising a longitudinally slidable bar element associated with each said space for optionally securing a bicycle in any one of said plurality of spaces and for optionally securing additional bicycles in others of said plurality of spaces;

means comprising a separate two-key lock for each of said spaces and its associated bar element for at times preventing releasing longitudinal movement of the associated bar element, said locks each having two cylinders having separate unlike keys appropriate to each of said cylinders, and each lock having means for insuring that at least one of said keys remains in the lock at all times, one of said keys for each lock being unique for said lock and the other being a key which is operable with all of the locks of said system.

3,887,076

DOCUMENT FILING RACK

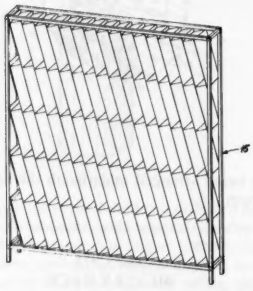
Mogens Drost Larsen, Teglvaerksvej 22, Jyderup, Denmark

Filed Mar. 13, 1973, Ser. No. 340,676

Claims priority, application Denmark, Mar. 15, 1972, 1208/72

Int. Cl. A47f 5/00; B42f 17/00

U.S. Cl. 211—10 3 Claims



1. A document filing rack comprising a plurality of wall-forming elements including end elements assembled as a unit so as to form a plurality of box shaped compartments having inclined side walls and top and bottom walls extending substantially perpendicularly thereto, each of said elements except said end elements consisting of a plate bent generally to Z-shape having a central portion and two end portions extending perpendicularly thereto in opposite directions, each of said end portions being provided at its free edge with one or more turned-out, deformable flaps defining projections thereon which are in engagement with pockets formed in or provided on the central portion of an adjacent element a short distance from one end thereof and on the surface facing away from the adjacent end portion, said turned-out flaps being bent at substantially right angles to said end portions, each of said end elements being L-shaped and including a central wall having flap receiving pockets adjacent a free edge thereof extending perpendicularly to said central wall, the end portions on said end elements having bent flaps engaging the pockets of the adjacent elements, the uppermost corner of each document compartment being disposed substantially vertically above the diametrically opposed lowermost corner of the same compartment.

3,887,077

CONTAINERS OR RACKS FOR SHEET MATERIAL

Martin Oscar Frey, Hill House Gloucestershire, Newnham, England

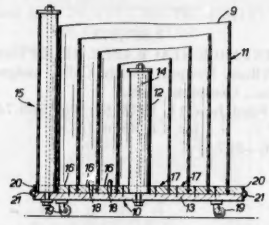
Filed Feb. 11, 1974, Ser. No. 441,323

Claims priority, application United Kingdom, Feb. 27, 1973, 9678/73

Int. Cl. A47f 1/16

U.S. Cl. 211—45 6 Claims

1. A container for cut sheets of thin flexible sheet material, comprising a rigid base formed with a spiral groove, a continuous coiled spiral wall formed of a thin sheet of synthetic plastics material, which is sufficiently rigid to be self-supporting but sufficiently flexible to be capable of being wound into a spiral, and has a smooth anti-friction surface, said wall having a plurality of turns, with successive turns spaced apart to form a coiled slot, having a substantially continuous open upper entry, the lower parts of the said wall being anchored in the spiral groove of said base, which locates the said wall in the required coiled configuration, the inner end of said wall being arranged to provide a closed hollow central cylinder, and the



outer end of said wall being formed to close off the outer end of said coiled slot.

3,887,078

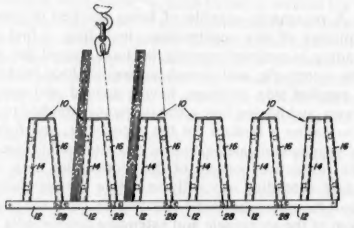
UNITIZED MODULAR RACK FOR VERTICAL STORAGE OF FLAT SHEET MATERIALS

Richard S. Jay, Evanston, Ill., assignor to Jarke Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 386,569, Aug. 8, 1973. This application Nov. 26, 1973, Ser. No. 418,859

Int. Cl. A47f 7/00

U.S. Cl. 211—50 6 Claims



1. A unitized module adapted for interconnection with one or more other such modules to form a modular rack for storage materials comprising, in combination,

a base member having a leading end and a trailing end each of said leading and trailing ends being provided with connecting means for interconnecting adjacent base members,

said base member formed by at least one base rail, said base rail having a forward support bar mounted thereon and spaced rearwardly from said leading end of said base member and extending upwardly therefrom,

said base rail further including a rear support bar mounted thereon and extending upwardly therefrom, said rear support bar overhanging the trailing end of said base member thereby to form a connecting offset,

said forward and rear support bars interconnected by a top frame member,

said leading end of one module cooperating with the connecting offset trailing end of a next adjacent module such that the point of interconnection between adjacent modules is removed from contact with the materials stored in said rack,

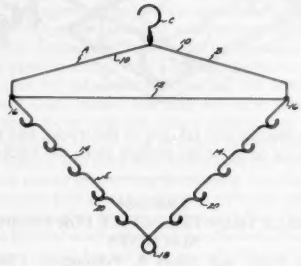
whereby interconnection of one unitized module with an adjacent module is accomplished by inserting the leading end of said base member of one module into the connecting offset trailing end of the next adjacent module such that said rear support bar overrides the leading edge of adjacent base members thereby to conceal the point of interconnection between adjacent unitized modules from the materials stored within said rack.

3,887,079

MULTI-PURPOSE CLOTHES HANGER COMBINATION

Beatrice L. Crew, 5120 Abbott Rd., South Gate, Calif. 90280

Filed Feb. 8, 1974, Ser. No. 440,672
Int. Cl. A47f *5/08*
U.S. Cl. 211—118 1 Claim



1. In combination with a first wire clothes hanger of the type that includes a cross bar engaging wire hook that has two oppositely disposed wire arms depending downwardly at an angle from the lower ends thereof and the arms on their lower ends connected by a wire cross piece, a device for supporting a plurality of clothes hangers parallel to one another and substantially normal to said cross piece, said device including: a V-shaped wire member that has two spaced ends on which eyes are formed that pivotally engage said cross piece, said V-shaped wire member when not in use capable of being pivoted to a first position to overlie said first coat hanger for said first coat hanger and device to occupy a minimum of space when not in use by said coat hanger lying substantially within the confines of said V-shaped member, but said V-shaped wire member capable of occupying a second position where it depends from said cross piece, with said V-shaped wire member having a number of spaced engageable hooks defined thereon that may be removably engaged by the hooks on a plurality of second clothes hangers to removably support said second clothes hangers parallel to one another in fixed spaced relationship when said V-shaped wire member is in said second position and said hook of said first clothes hanger engage said cross bar, and said cross bar when said V-shaped wire member is in said second position and not supporting said second clothes hanger capable of supporting a garment in a folded position thereon.

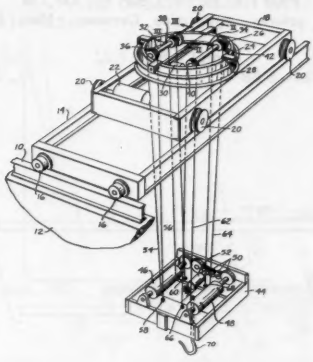
3,887,080

CRANE STRUCTURE

Ray Wilson, R.R. No. 1, Box 102, West Alexandria, Ohio 45381

Filed June 29, 1973, Ser. No. 374,924
Int. Cl. B66c *17/06*
U.S. Cl. 212—11 14 Claims

1. In a crane structure having a main frame moveable along stationary rails in one direction and a trolley moveable along the main frame in another direction; a load frame, drum means rotatable in said load frame, cable means connected to said drum means and leading upwardly therefrom, a carrier member adjacent said trolley, first means connecting said cable means to said carrier member in load transmitting relation thereto, and second means rotatably supporting said carrier member on said trolley, said second means being disposed beneath the top of said trolley and fixedly connected thereto.

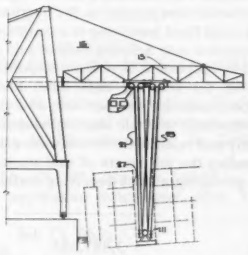


3,887,081

BALL ROTATION SHEAVE RELEASE

Charles Barrier Gill, San Mateo, Calif., assignor to Fruehauf Corporation, Alameda, Calif.

Filed Nov. 2, 1971, Ser. No. 194,877
Int. Cl. B66d *1/38*
U.S. Cl. 212—128 5 Claims



1. In a sway arrest system for cargo container handling lifting spreaders having sway arrest lines reeved through sheaves mounted on opposite sides of said spreaders, a bail rotation sheave release means for providing a tension release for the sway arrest lines, and for providing vertical side clearance for said lines from cell guides when a spreader is lowering a cargo container into a ship's hold, comprising

moveable bails securing said sway arrest sheaves to said spreader,

toggle linkage for moving said bails upwardly and inwardly from the down position with respect to said spreader, and power means for moving said toggle linkage to the up position and for locking said toggle linkage in the down position.

3,887,082

SYSTEM FOR HANDLING SURFACE-FINISHING LAYERS IN THE PRODUCTION OF PRESSED BOARD

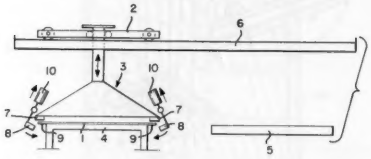
Manfred Posselt, Viersen, Germany, assignor to G. Siempelkamp & Co., Krefeld, Germany

Filed Feb. 28, 1973, Ser. No. 336,734

Claims priority, application Germany, Mar. 1, 1972, 2209691

Int. Cl. B66c *1/22*

U.S. Cl. 214—1 BB **2 Claims**



1. A system for the manipulation of a stack of surface-finishing layers applicable to a substrate in the formation of pressed board, comprising:

a table receiving said stack with opposite edges thereof overhanging said table;

horizontal track means extending from said table to a location horizontally spaced therefrom;

a carriage shiftable horizontally along said track means from a position overlying said table to said location;

a support vertically displaceable on said carriage;

respective clamps on said support along opposite edges thereof, said clamps each having a pair of relatively movable clamp jaws engageable with said overhanging edges of said stack on said table for displacement of said stack to said location, each of said clamps having a fixed jaw on said support and having a movable jaw swingable about a horizontal axis parallel to the overhanging edges of said stack, said fixed jaws lying in a common horizontal plane, a respective axle defining each of said axes and journaled on said support, a first fluid responsive device on said support for rotating each axle, and a second fluid-responsive device on each axle and carrying the respective movable jaw for shifting said movable jaw transversely and relative to the respective axle, said jaws each extending the full length of said stack; and

means providing a stack-receiving surface at said location.

3,887,083

SYSTEM FOR MOVING AND ALIGNING MODULAR HOUSE UNITS ONTO A FOUNDATION

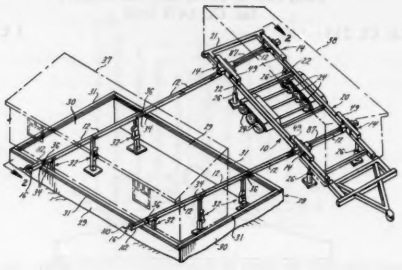
Bobby G. Baxter, Warrenton, Mo., assignor to The Binkley Company, Warrenton, Mo.

Continuation-in-part of Ser. No. 216,204, Jan. 7, 1972, Pat. No. 3,794,186. This application Mar. 8, 1973, Ser. No. 339,081

Int. Cl. B65g *67/24*

U.S. Cl. 214—1 H **10 Claims**

1. A module moving system for placing a module unit on a site foundation comprising means for supporting the module unit alongside the foundation, spaced tracks extending from between the module and support means across the foundation, first antifriction bearing means between the module and tracks for movement of the module along the tracks, second antifriction bearing means located between the module and the tracks for allowing transverse movement of the module relative to at least all but one of the tracks as the space between the tracks varies along their length, means between the first and second antifriction bearing means for providing rotation of the module unit relative to the tracks, and means for applying force to move the module along the tracks.



3,887,084

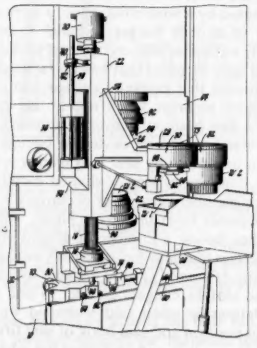
WORKPIECE TRANSFER DEVICE FOR PRODUCTION MACHINES

Sam Gallo, Flint, and James R. Pennington, Clio, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 23, 1973, Ser. No. 353,561

Int. Cl. B65g *47/04*

U.S. Cl. 214—1 BB **2 Claims**



1. A device for cycling workpieces between a workpiece loading-unloading station into and out of a machine having vertically oscillating workpiece support means therein comprising a single horizontally extending arm, a support plate secured to one end of said arm, separate and independent first and second workpiece holding chuck means for independently gripping and holding first and second separate workpieces, securing means for fastening said chuck means in a side-by-side relationship on one end of said arm, each of said chuck means extending vertically from said support plate and each having opposing workpiece gripping means relatively movable toward and away from one another for selectively releasing and gripping separate first and second workpieces, vertically-extending track means supporting said arm for movement in a vertical direction and for clockwise and counterclockwise turning movement into and out of said machine, first motor means for vertically moving said arm and said first and second chuck means to predetermined positions with respect to said

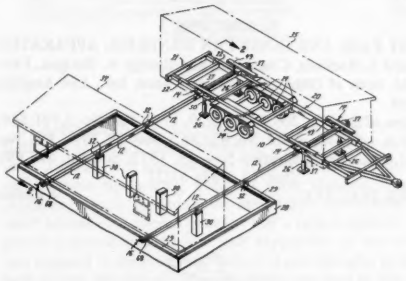
track means, a pivot axis, means mounting said track means for turning movement with respect to said pivot axis, second motor means for turning said track means and said arm with respect to said pivot axis, first stop means operatively connected to said track means for stopping the turning movement of said track means and said arm in a first rotary direction at a first station within said machine whereby said arm and a first of said chuck means can be vertically moved on said track means to pick up a finished workpiece from said workpiece support means from any vertical position thereof, second stop means operatively connected to said track means for stopping subsequent turning movement of said track means and said arm in said first rotary direction at a second station within said machine whereby said arm and said second of said chuck means can be vertically moved on said track means to load an unfinished workpiece onto said workpiece support means, and control means for subsequently effecting the turning movement of said track means and said arm in a second rotary direction opposite to said first rotary direction to move said finished workpiece out of said machine toward said loading-unloading station, and third stop means operatively connected to said track means for limiting the turning movement of said track means and said arm to a position vertically aligned with said loading-unloading station so that said first chuck means can unload finished workpiece and simultaneously said second chuck means can be loaded with an unfinished workpiece.

3,887,085

PREFABRICATED HOUSE MODULE MOVING SYSTEM

Bobby G. Baxter, Warrenton, Mo., assignor to The Binkley Company, Warrenton, Mo.

Division of Ser. No. 216,204, Jan. 7, 1972, Pat. No. 3,794,186.
This application Dec. 5, 1973, Ser. No. 421,758
Int. Cl. B65g *67/24*
U.S. Cl. 214—1 H **7 Claims**



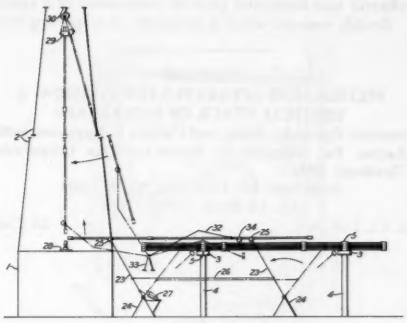
1. A roller pad for use in a system for moving a module unit over tracks and onto a site foundation comprising a body portion, first roller means for supporting the body portion for movement along a track, a roller track segment, second roller means for supporting the roller track segment on the body portion for transverse movement of the roller track segment relative to the track, the roller track segment adapted for supporting a portion of the module thereon, and adjustable means for securing the roller track segment in a selected fixed transverse position relative to the track, whereby the roller track segment is adjustable transversely relative to the track to a selected fixed transverse position.

3,887,086

PIPE RACKER

Homer J. Woolslayer, and Cecil Jenkins, both of Tulsa, Okla., assignors to Lee C. Moore Corporation, Tulsa, Okla.

Filed June 14, 1974, Ser. No. 479,296
Int. Cl. E21b *19/14*
U.S. Cl. 214—2.5 **9 Claims**



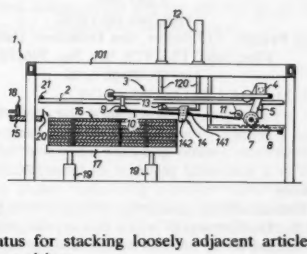
1. A pipe racker comprising laterally spaced elongated trays for supporting transversely thereof a plurality of parallel reclining pipestands at one side of a transfer zone, means for indexing said trays lengthwise across said transfer zone, transfer means for lifting each successive pipestand at said transfer zone from said members and moving it lengthwise a predetermined distance to locate its leading end at an elevating position in an oil well derrick, a steady arm normally extending lengthwise of the pipestands adjacent said transfer zone, means pivoting the end of said arm that is nearest said elevating position on a transverse horizontal axis, means connected to the other end of the arm for engaging the bottom of each lifted pipestand, and means for then swinging said arm upwardly and over toward said elevating position to control the trailing end of the engaged pipestand while its leading end is being elevated at said elevating position.

3,887,087

APPARATUS FOR STACKING LOOSELY ADJACENT ARTICLES

Bernhard Max Glaus, St. Gallen; Guido Maag, Niederstetten, and Hermann Knus, Gossau, all of Switzerland, assignors to Ulrich Steinemann AG Maschinenfabrik, St. Gallen, Switzerland

Filed Mar. 13, 1973, Ser. No. 340,661
Claims priority, application Switzerland, Mar. 27, 1972, 4541/72
Int. Cl. B65g *57/09*
U.S. Cl. 214—6 DK **6 Claims**



1. Apparatus for stacking loosely adjacent articles, said apparatus comprising:

at least one normally generally horizontal plate having an upper face for receiving said articles and having exposed front and rear edges;

means for guiding and moving said plate longitudinally forwardly and rearwardly, said entire plate being maintained substantially planar during said guiding and moving by said means for guiding and moving; and,

a stripper positioned above said upper face effective to remove said articles therefrom as said plate is moved longitudinally rearwardly;

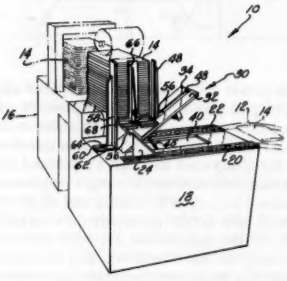
wherein said horizontal plate is constructed of a resilient flexible material which is incapable of supporting itself.

3,887,088

METHOD AND APPARATUS FOR FORMING A VERTICAL STACK OF SIGNATURES

Victoriano Fernandez-Rana, and Carlton V. Hageman, both of Easton, Pa., assignors to Harris-Intertype Corporation, Cleveland, Ohio

Filed Mar. 18, 1974, Ser. No. 452,201
Int. Cl. B65h *31/06, 31/34*
U.S. Cl. 214—6 C **20 Claims**



1. Apparatus for forming a dense, shingled array of signatures into a vertical stack comprising:

support means mounted in a first position for supporting signatures in a dense, shingled relationship including an inclined support surface against which a side surface of the signatures rest and a lower support for engaging the lower edges of the signatures;

actuating means for moving said support means from said first position to a second position wherein said inclined support surface extends generally horizontally; and,

pusher means operable at least when said support means is in said second position for applying a force against the edges engaging said lower support to bring the lower edges into generally vertical alignment relative to said inclined support surface.

3,887,089

PARKING DEVICE

Geoffrey Francis, 717 Sutter, San Francisco, Calif. 94104

Filed Sept. 13, 1973, Ser. No. 396,743
Int. Cl. E04h *6/06*
U.S. Cl. 214—16.1 B **1 Claim**

1. In a parking device wherein a plurality of car carriers move on a generally rectangular path with means for moving said car carriers around said path while maintaining the car carriers in a horizontal plane at all times, the improvement comprising:

a. a first set of four sprockets, said sprockets being located at the four corners of a first rectangular path,

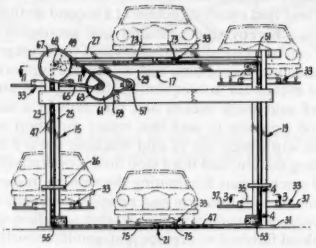
b. a second set of four sprockets, said sprockets being located at the four corners of a second rectangular path,

c. said first and second sets of four sprockets being congruent and having the same top and bottom horizontal planes but being offset laterally with respect to each other,

d. a first chain trained around the first set of sprockets, and a second chain trained around the second set of sprockets.

e. a plurality of car carriers, each of said carriers being of a generally flat rectangular configuration with relatively long side members and relatively short end members,

f. a crank shaft extending from each of said carriers at one end thereof, each of said crank shafts having a crank arm extending from the crank shaft at right angles to the crank shaft,



g. the length of said crank shafts being substantially equal to the distance by which the first and second sets of sprockets are offset laterally to each other,

h. the terminal end of each crank arm having a crank pin extending therefrom, said pin being generally parallel to said crank shaft,

i. means for pivotally attaching each of said crank shafts to fixed positions on said first chain,

j. means for pivotally attaching each crank pin to fixed positions on said second chain while maintaining each crank arm horizontal, and

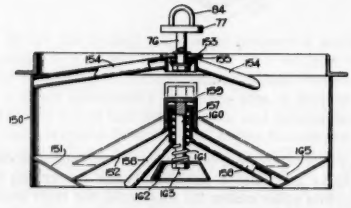
k. means for moving said first and second chains around said first and second sets of sprockets.

3,887,090

HOIST PANS AND HOIST PAN HANDLING APPARATUS

Bernard S. Reckseit, Cincinnati, and George A. Burgess, Fairfield, both of Ohio, assignors to Sweco, Inc., Los Angeles, Calif.

Division of Ser. No. 206,568, Dec. 9, 1971, Pat. No. 3,791,539, which is a division of Ser. No. 825,862, May 19, 1969, Pat. No. 3,697,006. This application Nov. 15, 1973, Ser. No. 415,990
Int. Cl. B65g *65/32*
U.S. Cl. 214—17 C **4 Claims**



1. A hoist pan for use in a material handling system for mills comprising

a housing having at least a circular peripheral portion,

means coupled with said housing for supporting said housing for rotation about the central axis thereof, said means comprising a bearing assembly and arm means coupled between said bearing assembly and said housing,

an insert mounted within said housing near the lower extremity thereof,

a movable bottom mounted within said housing comprising a substantially conical member mounted for up and down movement within said housing, the outer periphery of which engages said insert to close said pan, and

spring biasing means coupled with said movable bottom of said insert for normally closing said bottom, said spring biasing means comprising a spring housing mounted substantially coaxially within said housing and coupled with said insert, said spring housing containing a spring therein, and said conical member including a shaft extending through said spring housing and terminating in an actuator near the central lower extremity of said pan means for engaging a central projection of a mill for causing said bottom to raise and dump the contents of said pan means into said mill.

3,887,091

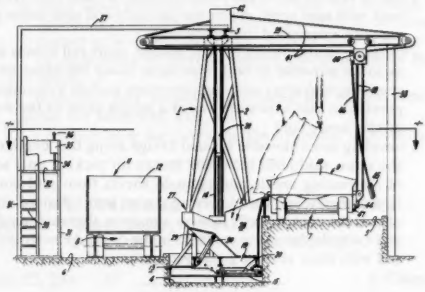
TRANSFER APPARATUS FOR BULK GRAPES

Charles Herbert Buck, Acampo, Calif., assignor to Liberty Winery, Inc., Acampo, Calif.

Filed May 18, 1973, Ser. No. 361,660

Int. Cl. B65g *67/02*

U.S. Cl. 214—38 R **3 Claims**



1. Apparatus for transferring bulk grapes from the bin of a field cart at an unloading station to a bin of a highway truck at an adjacent but spaced-apart loading station, comprising a main frame upstanding between such stations, a power-actuated elevator guided on the main frame for vertical movement between a lowered position and a raised position, and a power-actuated transfer bin unit supported on the elevator and adapted in the lowered position of said elevator to receive bulk grapes discharged from the field cart and in the raised position of such elevator to discharge such bulk grapes into the bin of the highway truck; the elevator including a bed-like carriage thereon, the transfer bin unit being supported by the carriage, means mounting the carriage on the elevator for guided shifting movement laterally of the main frame to dispose the transfer bin unit adjacent the unloading station when the elevator is in lowered position and to dispose the transfer bin unit adjacent the loading station when the elevator is in raised position, and power means between the elevator and carriage operative to so shift the latter; and the transfer bin unit including a longitudinal row of separate side-by-side bins, means pivotally mounting the separate bins on the carriage for independent tilting but all in a like direction to discharge into the bin of the highway truck at the loading station when the transfer bin unit is adjacent thereto, and power means between the carriage and the separate bins operative to selectively and independently tilt said bins in such like direction.

3,887,092

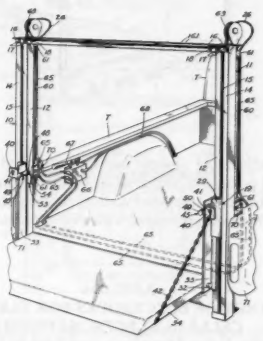
TAIL GATE LIFT MECHANISM

Richard A. Leet, 3118 Williamsburg Ave. N.W., Warren, Ohio 44485

Filed Mar. 16, 1973, Ser. No. 341,883

Int. Cl. B60p *1/44*

U.S. Cl. 214—75 T **1 Claim**



1. A tail gate lift mechanism for attachment to the rear portion of a truck, comprising:

a pair of elongated hollow members, each attached to one side of the truck at the rear thereof and extending vertically, each member having a longitudinally extending slot,

a roller assembly disposed within each hollow member for vertical movement therein, each roller assembly having a leg portion extending through a respective slot,

a tail gate member connected to each leg portion outwardly of the related hollow member.

a tail gate pivotally connected between said tail gate members,

power means connected to said roller assemblies to elevate the same and thus the tail gate,

latch means supported for movement with said tail gate and operable to stop unintentional movement of the latter below the level of the bed of said truck, said latch means comprising a short tube connected to said tail gate member, a rod slidably carried within said tube, and a stop secured to a hollow member, said rod engaging said stop to limit downward movement of said tail gate, said rod being movable to a retracted position clear of said stop to permit movement of said tail gate to a position below the level of said truck bed,

said tail gate when swung to position closing the rear of said truck bed automatically moving said rod to an extended position for engagement with said stop.

3,887,093

BOAT TRAILER

Gerald D. Howell, 802 Harrison Rd., Longview, Tex. 75601

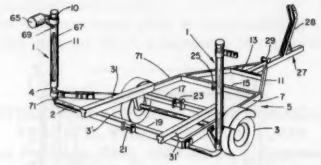
Filed June 1, 1972, Ser. No. 258,775

Int. Cl. B60p *1/52*

U.S. Cl. 214—84 **7 Claims**

1. A boat trailer comprising a trailer frame mounted on wheels, a pair of L-shaped cylindrical guide members located one on each side of said trailer frame with the horizontal portions of the L-shaped guide member traversing beneath the respective sides of the trailer frame near its loading end, a tubular interconnecting member, said horizontal portions of the L-shaped member being in telescoping engagement with

said interconnecting member to provide lateral movement of the L-shaped guide members relative to said frame, means for mounting the respective L-shaped members to the sides of the trailer frame comprising a bracket provided with means through which the horizontal portion of the L-shaped member



slides, an adjustable support member attached at one end to the vertical portion of said L-shaped member and at the other end to the trailer frame, said vertical portion of said L-shaped guide member being provided with a rotatable tube of resilient material.

3,887,094

CONVEYANCE OF ELECTRODES FOR ELECTROLYTIC CELLS IN ELECTROREFINING

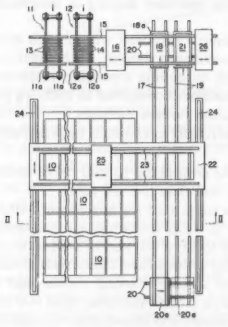
Hiroshi Ikeda; Yukio Matsubara, and Ginichi Yamaguchi, all of Iwaki, Japan, assignors to Onahama Seiren Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1974, Ser. No. 452,343

Claims priority, application Japan, July 7, 1973, 48-76846

Int. Cl. B66b *17/00*

U.S. Cl. 214—89 **11 Claims**



1. A method of conveying anode and cathode sheets into and out of an array of open-top electrolytic cells mounted on a floor and including a series of parallel rows of cells, wherein said anode and cathode sheets are each provided with a pair of lugs or the like so as to be supported vertically in a suspended manner throughout the entire process of conveyance, said method comprising the steps of:

providing a traveling bridge spanning said array of cells in a direction parallel to said series of rows and movable transversely of said rows;

conveying fresh anode and cathode sheets as vertically suspended and alternately arranged successive sets of anode and cathode sheets along a conveying path transverse to said series of rows to the adjacency of said array of electrolytic cells at a position in alignment with a selected row of cells;

moving said bridge to a position in alignment with said selected row of cells;

moving a traveling hoist on said bridge along the length thereof to a starting position directly above said fresh set of sheets which have been conveyed to said starting position;

moving said hoist reciprocally between said starting position and each of the positions of all the cells of said selected row to carry fresh sets of sheets successively into all the cells of said selected row and to carry used sets of sheets in the cells to said starting position successively on the way back of said hoist to the starting position for exchange of the sets in the cells;

maintaining said bridge in said position in alignment with said selected row until the exchange of the sets in all the cells in said selected row has been completed; and

moving said bridge to another position in alignment with another selected row of cells to repeat the above mentioned operation.

3. A conveying system in an electrolytic metal refining plant, for conveyance of anode and cathode sheets into and out of an array of open-top electrolytic cells mounted on a floor and including a series of parallel rows of cells, wherein said anode and cathode sheets are each provided with a pair of lugs or the like so as to be supported vertically in a suspended manner throughout the entire process of conveyance, said system comprising:

means for conveying said anode and cathode sheets as a vertically suspended and alternately arranged set of anode and cathode sheets along a conveying path parallel to said series of rows to the adjacency of said array of electrolytic cells;

a pair of spaced apart rail means parallel to said conveying path with said array of electrolytic cells and said conveying path interposed therebetween;

a traveling bridge riding on said spaced apart rail means so as to be movable in both directions along the same and spanning said array and said conveying path in a direction parallel to said series of rows at a height close to the top of said array; and

a traveling hoist movable on said bridge along the length of the same, said hoist including means for picking up a set of alternating anode and cathode sheets from said conveying means and then lowering the set into a desired one of said electrolytic cells in such a manner that said anode and cathode sheets are released in the desired electrolytic cell with their relative positions unchanged.

3,887,095

POWER-OPERATED VEHICLE

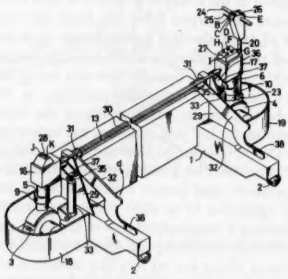
Seiichi Suzuki, Shiga, Japan, assignor to Todo Seisakusho Ltd., Kyoto-shi, Japan

Filed June 24, 1974, Ser. No. 482,411

Claims priority, application Japan, Mar. 18, 1974, 49-31457

Int. Cl. B60p *1/16*

U.S. Cl. 214—130 R **6 Claims**



1. A power-operated vehicle for transporting a beam, comprising, in combination:

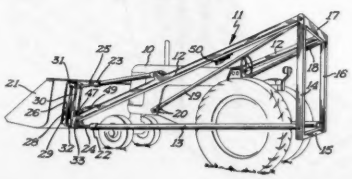
1. a base having a front portion and a rear portion,
2. a front wheel at the front portion and a rear wheel at the rear portion of the base,
   a. the front and rear wheels being independently driven,
   3. support shafts pivotal about a vertical axis and mounting the front and rear wheels on the base for pivoting the wheels about the vertical axis whereby the vehicle base is steered in the direction of the wheel pivoting,
4. a connector bar interconnecting the support shafts for pivoting the shafts in unison,
5. a steering shaft operably connected to one of the support shafts for pivoting the shaft in a direction transverse to the vertical axis thereof,
6. a braking control means for the wheels carried by the steering shaft,
7. control means for controlling forward and reverse motion as well as high and low speed motion of the wheels,
8. another control means operatively associated with the other support shaft for controlling forward and reverse motion of the wheel supported by the other support shaft in low speed motion,
9. freely rotatable rollers mounted on the vehicle base laterally offset from the front and rear wheels and forming a quadrangular wheeled support therefor,
10. a pair of beam support arms mounted on the vehicle base for relative movement in respect of each other along a horizontal axis,
   a. each beam support arm having a free end defining a recess for receiving and supporting a beam to be transported upon movement of the support arms in respect of each other in correspondence to the length of the beam,
11. hydraulic jack means for pivoting the support arms about the horizontal axis, and
12. a control lever for operating the hydraulic jack means.

3,887,096

QUICK ATTACHMENT AND RELEASE DEVICE

Lloyd R. Wieland, Dazey, N. Dak. 58429

Filed Oct. 11, 1973, Ser. No. 405,625
Int. Cl. E02f *3/70*
U.S. Cl. 214—145 **8 Claims**



8. A quick attachment and release device for releasably attaching a first member to a second member which comprises:

a rectangular key having a substantially planar major and a minor dimension pivotally mounted to said first member for rotation about the transverse axis of said key;

a C-shaped bracket secured to said second member to permit registration with said rectangular key, and having an inner surface with a maximum inside dimension slightly greater than said major dimension and an opening smaller than said major dimension and greater than said minor dimension to thereby permit entry of said key into said bracket; and

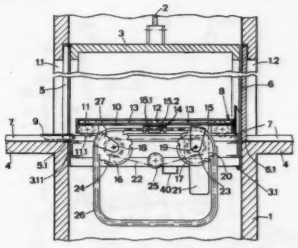
means for orienting said rectangular key for passage through said opening of said C-shaped bracket and for pivoting said rectangular key to orient said key with said minor dimension of said rectangular key substantially contiguous with said inner surface of said C-shaped bracket for locked engagement therewith.

3,887,097

APPARATUS FOR AUTOMATIC LOADING AND UNLOADING OF AN ELEVATOR CABIN

Ernst Ach, Ebikon, Switzerland, and Walter Herding, Amberg, Germany, assignors to Inventio Aktiengesellschaft, Hergiswil NW, Switzerland

Filed Mar. 29, 1974, Ser. No. 456,061
Claims priority, application Switzerland, Apr. 2, 1973, 4714/73
Int. Cl. B65g *47/00*
U.S. Cl. 214—730 **8 Claims**



1. An apparatus for the automatic loading and unloading of an elevator cabin having an elevator cabin floor at a story of a building, comprising at least one transport carriage which can be moved along with the elevator cabin, a driven buckling-resistant roller chain, guide means for the roller chain beneath the floor of the elevator cabin, said transport carriage being provided with an entrainment member secured thereto and facing the cabin floor, the buckling-resistant roller chain engaging via the entrainment member with the transport carriage for selectively moving the transport carriage out of and into the elevator cabin at a story of the building, said transport carriage being capable of assuming a starting position in the elevator cabin, said buckling-resistant roller chain being provided with two confronting terminal elements, wherein in the starting position of the transport carriage in the elevator cabin both confronting terminal elements of the buckling- resistant roller chain engage with said entrainment member, said terminal elements confronting one another until one of said terminal elements disengages from said entrainment member, drive means incorportating two synchronously rotating sprocket wheels for driving the buckling-resistant roller chain, said sprocket wheels being rotatably mounted behind one another at the cabin floor one on each side of the entrainment member of the transport carriage when located in its starting position, each sprocket wheel having associated therewith one of said terminal elements, and wherein during travel of the transport carriage in the one or the other direction of travel one of said terminal elements defines a forwardly located terminal element, said forwardly located terminal element upon passing the associated sprocket wheel being disengaged from the entrainment member and upon return movement of the transport carriage being re-engaged with said entrainment element, and the other terminal element in the engaged position with the entrainment member transmitting a driving force to the transport carriage.

3,887,098

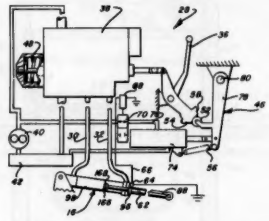
MATERIAL HANDLING APPARATUS

Clayton L. Brundige, Rochester, and William H. Bechman, Williamsville, both of N.Y., assignors to Eaton Corp., Cleveland, Ohio

Filed Sept. 28, 1973, Ser. No. 401,685
Int. Cl. E02f *3/84*
U.S. Cl. 214—762 **14 Claims**

1. A material handling apparatus comprising bucket means for carrying materials, motor means for moving said bucket means between first and second positions, a magnet having

first and second magnetic poles, detector means actuable under the influence of the magnetic field emanating from said magnet to provide an output signal upon movement of said bucket means to said second position, means connected to said motor means for effecting relative movements between said magnet and detector means to reduce the distance between said magnet and detector means during movement of said bucket means from said first position to said second position, said magnet being disposed in such an orientation relative to said detector means that said first magnetic pole is closer to said detector means than said second magnetic pole



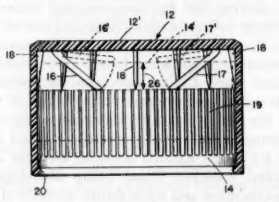
during movement of said bucket means toward said second position, and pole shading means comprising a member made of a magnetizable material disposed adjacent to said first magnetic pole for diffusing the portion of the magnetic field associated with said first magnetic to a greater extent than the portion of the magnetic field associated with said second magnetic pole to insure actuation of said detector means only when said second magnetic pole is adjacent said detector means thereby preventing premature actuation of said detector means by said first magnetic pole during movement of said bucket means toward said second position.

3,887,099

CONTAINER SAFETY CLOSURE

Robert N. Gillman, South Plainfield, N.J.; Anthony J. Koehne, Severna Park, and Harry O. Baughan, III, Baltimore, both of Md., assignors to Poly-Seal Corporation, Baltimore, Md.

Filed Nov. 1, 1973, Ser. No. 411,701
Int. Cl. B65d *55/02, 85/56;* **A61j** *1/00*
U.S. Cl. 215—220 **1 Claim**



1. A safety closure for a threaded cylindrical neck portion surrounding an opening in a container comprising:

a. said closure having an inner and outer plastic cap member, each cap member being provided with a closed top portion, a cylindrical side wall portion and an open bottom, the cylindrical side wall being in a plane at right angles to the closed top portion;

b. the outer surface of the cylindrical side wall of the inner cap being serrated to a point above its open end, leaving a narrow unserrated band about the said open end;

c. the outer cap member being of slightly larger diameter and of greater height than the inner cap wherein the outer cap is adapted to encase the inner cap in a free rotatable and axially slideable movement relative to the inner cap;

d. a bead extending about the lower inner surface of the outer cap for retaining the outer cap in position over the inner cap;

e. a pair of resilient members having one end of each member secured to the inner surface in diametrical relationship adjacent the outer peripheral edge of the inner top surface having their free ends angled toward the center of the cap, wherein the free ends of the said resilient members are adapted to engage the outer surface of the closed end of the inner cap at an angle when the two caps are in assembled relationship;

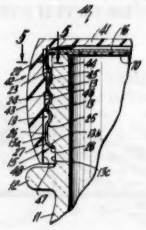
f. a plurality of tapered splines integrally formed on the inner surface of the outer cap member of substantially one third the length of the side wall of the outer cap member beginning at a point above the upper surface of the top portion of the inner cap when the caps are in normal extended position and tapered upwardly and outwardly in the direction of the center of the outer cap terminating at the inner surface of the top portion of the outer cap for engaging the recesses located between the said serrations on the outer surface of the side wall of the inner cap for rotating the inner cap in either direction when engaging the said recesses when the outer cap is depressed to a point where the splines of the outer cap engage the said recess of the inner cap.

3,887,100

ANTI STRIP OVERCAP FOR METAL SCREW CAPS FOR BOTTLES OR CONTAINERS

Monroe J. Coven, and Chester C. Moss, both of Brooklyn, N.Y., assignors to Monarch Wine Co., Inc., Brooklyn, N.Y.

Filed Oct. 25, 1973, Ser. No. 409,762
Int. Cl. B65d *41/32*
U.S. Cl. 215—256 **9 Claims**

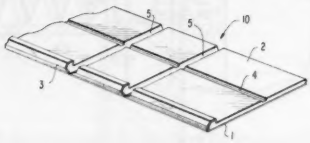


1. The combination of an overcap and a screw cap, said overcap being of substantially rigid material and having a top wall, an annular skirt extending downwardly therefrom and formed at its inner surface with an annular knurled ring forming alternating vertical ridges and grooves, said screw cap having a top wall and a skirt and being formed with a knurled ring complementary to the knurled ring of the skirt of said overcap and engaged therewith, and being disposed within said overcap, engagement of said knurled rings being such as to rotate the overcap together with said screw cap in one direction, when the screw cap is free to rotate below and to rotate the overcap in said direction relative to the screw cap without damage to either the overcap or screw cap when the screw cap is not free to rotate.

3,887,101
SPEAKER BOX CABINET AND METHOD OF MANUFACTURING THE SAME

Hisao Adachi, Fukuroi, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed June 11, 1973, Ser. No. 368,930
Claims priority, application Japan, June 10, 1972, 47-68465[U]
Int. Cl. A47b 81/06
U.S. Cl. 220—4 F 4 Claims

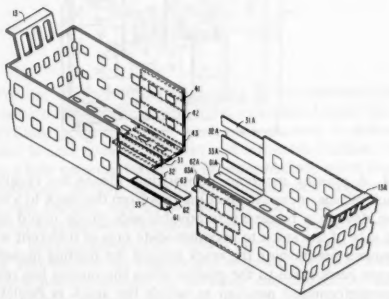


1. In a speaker box cabinet or the like formed be bending a laminated sheet comprising a thin film outer layer bonded to a thick inner backing layer along spaced parallel deep bend grooves extending through the inner backing layer to the outer film layer, the improvement wherein: at least one shallow groove extends longitudinally of said laminated sheet within said inner layer to correct for camber of said sheet prior to forming said deep bend grooves and bending the sheet at said deep grooves, with said deep bend grooves extending uniformly throughout their length, completely through said thick inner layer but not into said thin film outer layer.

3,887,102
VENTILATED, ADJUSTABLE SIZE, OPEN TOP RECEPTACLE

Donald C. Earley, 166 S. Arcadia Pk., Lexington, Ky. 40503

Filed Feb. 7, 1974, Ser. No. 440,529
Int. Cl. B65d 11/14
U.S. Cl. 220—8 8 Claims

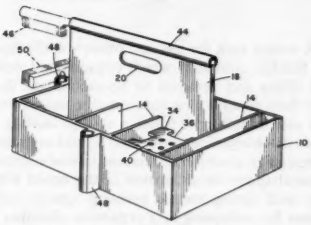


1. An adjustable size open-top basket having two substantially identical molded segments telescopically fitted together, each of said segments comprising an end wall, bottom member joined to said end wall and having an array of tunnel portions extending toward said end wall and an array of plate portions projecting from the distal end of the bottom member, the entire array of tunnels being spaced laterally from the array of plates and with the number of plates being equal to the number of tunnels, first and second side walls integrally joined to each of the adjacent edges of the end wall and of the bottom member, said first side wall having an array of tunnels projecting toward said end wall and said second side wall having an array of plates projecting from its distal end, whereby upon arranging of one basket segment in juxtaposition to the other segment the projecting plates of one segment will engage with a telescopic sliding fit into the corresponding tunnels of the other segment permitting variation of the size of the basket while avoiding collapse of the basket under substantial loading by the contents of the basket.

3,887,103
SWIMMING POOL EQUIPMENT CARRYING CASE

Edward Spooner, 5431 Bahia Ln., La Jolla, Calif. 92037

Filed Apr. 23, 1973, Ser. No. 353,541
Int. Cl. B65d 1/36
U.S. Cl. 220—20 1 Claim



1. A carrying case adapted for swimming pool maintenance equipment including equipment items having simple cylindrical handles, said case comprising:

a. a box having two sides, two ends, a bottom and being open at the top;

b. means dividing the interior of the box into open-topped compartments, each compartment being shaped and dimensioned to receive a specific item of swimming pool maintenance equipment;

c. one of said compartments being elongated, defined in part by one of said ends, and extending the full length thereof to receive a skimmer net;

d. said dividing means including a central partition wall parallel to said sides and extending vertically from said bottom to well above said sides, ends and dividing means and extending from adjacent said elongated compartment to the end remote therefrom to effectively prevent spill-over of equipment items from one side of the case to the other;

e. said partition wall having a handgrip opening near the top thereof;

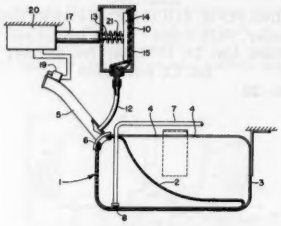
f. said dividing means defining two substantially equal-sized chemical compartments diagonally disposed relative to one another in said box whereby said box is substantially balanced in use;

g. one of said compartments having a tray well above said bottom and recessed below the upper edges of said dividing means, sides and ends and having apertures therethrough for holding tools spaced from said bottom and thus retained in dry condition and out of contact with any water inadvertantly admitted into the carrying case;

h. a hollow open-ended cylinder mounted along the upper edge of said partition wall and extending the substantial length thereof for receiving an elongated brush handle; and

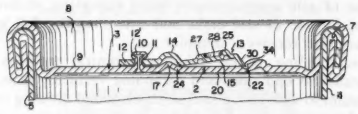
i. a plurality of hollow vertical cylindrical sockets mounted on the exterior of said box and being open at both ends whereby elongate-handled brushes may be carried therein regardless of handle length.

3,887,104
SEALED GAS TANK
David F. Cole, 99 Elmridge Rd., Mansfield, Ohio 44907
Filed Oct. 7, 1970, Ser. No. 78,786
Int. Cl. B65d *87/16*
U.S. Cl. 220—85 B **3 Claims**



1. A sealed tank for gas and other volatile liquids comprising a flexible container which expands and collapses during liquid filling and removal to accommodate the liquid contained therein, a fill pipe connected to said container through which said container is filled, a cap for sealing said fill pipe, a liquid discharge line connected to said container, a collapsible expansion chamber connected to said container providing additional space for expansion of the liquid within said container, and spring means pressing against said expansion chamber for collapsing said expansion chamber during filling of said container to prevent entrapment of air and gas vapors in said expansion chamber.

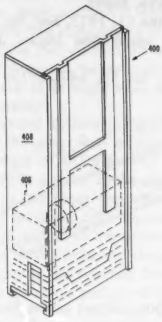
3,887,105
NON-DETACHABLE TEAR FLAP AND TAB FOR CONTAINERS
Wayne T. Chiappe, Hinsdale, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Filed Nov. 23, 1973, Ser. No. 418,322
Int. Cl. B65d *41/02*
U.S. Cl. 220—277 **10 Claims**



1. An easy opening container comprising an end panel having a portion defining a flap severable from the panel to provide an opening and having a tab anchored to the container, said tab having a disk-like flap-overlying portion with finger-protection means comprising a depression thereon for retaining the finger of a user in essentially centered relation to the flap-overlying portion which upon entering the opening maintains the finger away from the edge of said opening.

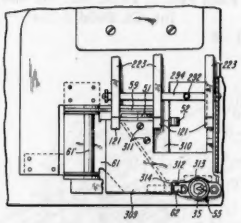
3,887,106
TICKET CARTRIDGE AND HOPPER AND STACKER THEREFOR
Paul Marlin Charlson; Charles Donald Green; William John Harris, all of Rochester, Minn., and Keith Erwin Inman, Leander, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 7, 1973, Ser. No. 413,749
Int. Cl. B65h *1/06*
U.S. Cl. 221—197 **6 Claims**

5. A stacker station for receiving generally rectangular merchandising tickets comprising a cartridge of rectangular cross section having a bottom, said bottom being defined by a pair of side flanges extending inwardly from side walls of the cartridge and being discontinuous to provide a ticket entrance slot in the bottom at a ticket entrance end of the cartridge,



rolls positioned below said cartridge, means for drivingly rotating at least one of said rolls, said rolls being positioned in such position as to move a merchandising ticket through said slot in the bottom of the cartridge and thus into the cartridge.

3,887,107
PINNING MACHINE
Harold N. Grushon, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio
Division of Ser. No. 320,340, Jan. 2, 1973, Pat. No. 3,837,554.
This application Apr. 1, 1974, Ser. No. 456,711
Int. Cl. B65h *31/20*
U.S. Cl. 221—241 **8 Claims**

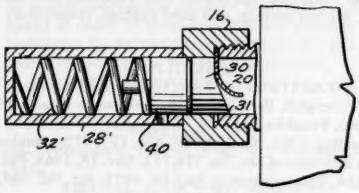


1. A pinning machine, comprising: means for receiving a stack of tags, means for feeding tags from the stack to a utilization device, a relatively removable side guide urged against the side of the stack to accommodate tags of different widths, a pusher for pushing the stack toward the feeding means, and means responsive to the pusher when the pusher has reached a predetermined position in which the stack is depleted or nearly depleted for preventing the side guide from moving into the space occupied by the stack.

3,887,108
PRESSURE RELEASE METHOD
Marvin L. McDaniel, 11222 Astronaut Blvd., Orlando, Fla. 32809, and Michael Ivashuk, 1800 S.W. Seventh Ave., Pompano Beach, Fla. 33060
Filed May 15, 1972, Ser. No. 253,510
Int. Cl. B67b *7/24*
U.S. Cl. 222—1 **2 Claims**

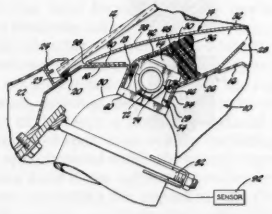
1. A method for quickly releasing fluid under high pressure from a container thereof through an aperture having a diaphragm covering the aperture and sealed around its periphery to the container, said method comprising urging a pointed piercing means through the diaphragm at a location immedi-

ately adjacent the periphery of the aperture to form a flap having a free edge portion and an opposite supported portion which is integral with the remainder of the flap; and ripping out the flap from the sealed circumferential edge supported



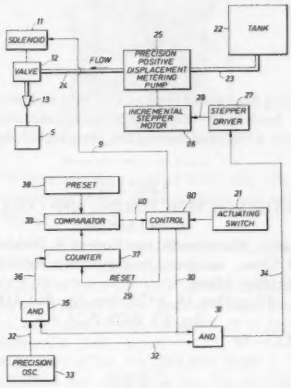
portion of the diaphragm by means of the pressure of the fluid in the container acting against the flap and creating a moment of force which bends the flap about its remaining supported portion.

3,887,109
VALVE ARRANGEMENT FOR A VEHICULAR INFLATABLE CUSHION
Herbert A. Libkie, Marlette, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed May 13, 1974, Ser. No. 469,311
Int. Cl. B60r *21/10*
U.S. Cl. 222—3 **2 Claims**



1. For use with a housing containing an automotive inflatable cushion and having a cylindrical extension formed at an intermediate point along the underside thereof; a diffuser mounted in said housing adjacent said inflatable cushion and having a first opening formed at an intermediate point along the underside thereof and a second opening formed in the upper side thereof, and an inflator; an improved valve and connector arrangement therefor, comprising a valve member having a hexagonally-shaped central portion, means formed on one end thereof for connection with said inflator, and a cylindrical portion formed on the other end thereof, an axial passage formed through said valve member and an end-cap formed on said cylindrical portion, a transverse passage formed through said cylindrical portion adjacent said end-cap, a tubular member having tapered end surfaces formed on the ends thereof and being mounted in said transverse passage, said tapered end surfaces extending beyond the ends of said transverse passage, two pairs of aligned slots formed in oppositely disposed sides of said diffuser, said two pairs of slots being spaced a predetermined distance apart along the axis of said diffuser, a pair of resilient locking members each having tabs formed at the upper end thereof for mounting in said respective pairs of aligned slots, an opening formed in each of said resilient locking members, said valve member being operatively connected to said diffuser by having said cylindrical portion thereof inserted through said cylindrical extension and said first opening such that said tapered ends of said tubular member cause said resilient locking members to spread against the restraint of said tabs in said respective aligned slots until said ends of said tubular member snap through said respective locking member openings.

3,887,110
DISPENSING METHODS AND APPARATUS
Lawrence C. Porter, Palos Verdes Peninsula, Calif., assignor to The Upjohn Company, Kalamazoo, Mich.
Continuation of Ser. No. 71,144, Sept. 10, 1970, abandoned. This application Sept. 18, 1972, Ser. No. 289,858
Int. Cl. B67d *5/30*
U.S. Cl. 222—16 **5 Claims**



1. A system for dispensing a predetermined amount of material into a receptacle or the like, comprising

pulse generating means for producing electrical actuating pulses,

gating means interconnected with said pulse generating means and openable for passing said actuating pulses,

transfer means interconnected with said gating means for dispensing a preselected discrete quantity of said material in response to each actuating pulse received from said pulse generating means,

counting means interconnected with said gating means for receiving and counting pulses,

preset means for providing a functional representation of a predetermined number of said actuating pulses,

comparator means interconnected with said preset and counting means for providing a completion signal when the number of actuating pulses received and counted by said counting means corresponds with said functional representation, and

control means for opening said gating means for passing pulses to said transfer and counting means and closing said gating means and resetting said counting means in response to said completion signal from said comparator means.

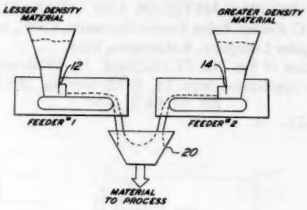
3,887,111
DENSITY CONTROL FEEDER SYSTEM
Kenneth W. Bullivant, Turnersville, N.J., assignor to K-Tron Corporation, Glassboro, N.J.
Filed June 7, 1973, Ser. No. 367,981
Int. Cl. B67d *5/08*
U.S. Cl. 222—57 **8 Claims**

1. A method of feeding variable density material at a preselected density, comprising the steps of:

feeding material having a density less than the preselected density through a first controllable digital feeder;

feeding material having a density greater than the preselected density through a second controllable digital feeder;

generating digital signals responsive to a preselected set point density and to the actual density of the material fed by both said first and second controllable feeders; and



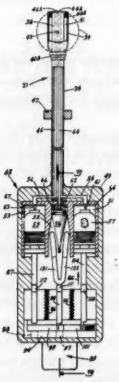
controlling the rate of feed of said first and second controllable feeders in response to said generated signals to provide a material having the preselected density.

3,887,112

APPARATUS FOR PUNCTURING AND COLLAPSING A CONTAINER

Lee R. Bolduc, Minneapolis, and Eugene A. Dickhudt, St. Paul, both of Minn., assignors to Population Research Incorporated, Fridley, Minn.

Filed May 18, 1973, Ser. No. 361,418
Int. Cl. B67b *7/26*
U.S. Cl. 222—85 **32 Claims**



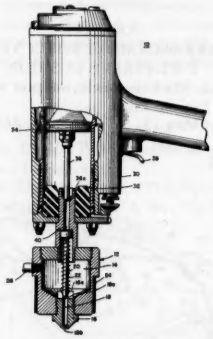
1. An apparatus for sequentially dispensing a first fluid, a second fluid, and a third fluid comprising: a housing having a first chamber, a second chamber, and a third chamber, first container means storing the first fluid located in the first chamber, second container means storing the second fluid located in the second chamber, third container means storing the third fluid located in the third chamber, first needle means operable to puncture the first container means, second needle means operable to puncture the second container means, third needle means operable to puncture the third container means, means having a passage for receiving a first fluid from the first container means, a second passage for receiving the second fluid from the second container means, and a third passage for receiving the third fluid from the third container means, first movable means operable to cause the first needle means to pierce a portion of the first container means whereby the first fluid flows from the first container means to the first passage, second movable means operable to cause the second needle means to pierce the second container means whereby the second fluid from the second container means flows to the second passage, third movable means operable to cause the third needle means to pierce the third container means whereby the third fluid from the third container means flows to the third passage, actuator means operable to sequentially move the first movable means, the second movable means, and the third movable means whereby the first fluid, second fluid, and third fluid are sequentially dispensed into the first passage, second passage, and third passage, respectively.

3,887,113

APPARATUS FOR FASTENING ARTICLES

Allen R. Obergfell, Park Ridge, Ill., assignor to Duo-Fast Corporation, Franklin Park, Ill.

Continuation of Ser. No. 172,980, Aug. 19, 1972, abandoned, which is a division of Ser. No. 776,712, Nov. 18, 1968, Pat. No. 3,616,034. This application July 19, 1973, Ser. No. 380,620
Int. Cl. G01f *11/00*
U.S. Cl. 222—146 HE **2 Claims**



1. Apparatus for driving adhesive through a solid workpiece to the interface thereof with a base member, said apparatus comprising in combination:

a portable hand-held tool including a housing and a handle;

a nose portion supported on said housing in a fixed position relative to said housing and adapted to be placed adjacent the workpiece;

a pneumatic cylinder in said housing and a piston in said cylinder movable toward and away from said nose portion;

control means including a trigger disposed adjacent said handle for moving said piston in a drive stroke toward said nose portion;

said nose portion including a first chamber for containing a body of liquid adhesive;

heating means mounted on said nose portion for heating said adhesive to a temperature sufficient to maintain said adhesive in a viscous condition;

an elongated second chamber in said nose portion substantially smaller than said first chamber, said second chamber having an inlet communicating with the first chamber at one end to permit liquid adhesive to flow from the first chamber into the second chamber;

a plunger supported in said nose portion extending through the first chamber and mounted for reciprocating movement along a path between a first position substantially removed from the second chamber and a second position at least partly in said second chamber;

a nozzle including a restricted orifice leading from said second chamber to the exterior of said nose portion;

means for normally urging said plunger toward said piston and out of said second chamber; and

a drive member supported by said piston and normally spaced from said plunger;

said drive member striking said plunger during said drive stroke for driving said plunger into said adhesive cylinder to propel said viscous adhesive from said nozzle at high speed in order to drive said adhesive through the solid workpiece by its own inertia and into the interface between the workpiece and the base member.

3,887,114

MORTAR LAYER

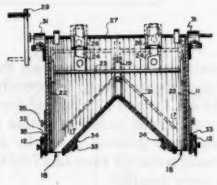
Augusto Villanovich, 558 St. Clair St., Chatham, Ontario, Canada

Filed Aug. 2, 1973, Ser. No. 384,959

Claims priority, application Canada, June 7, 1973, 173524

Int. Cl. A01c *15/00*

U.S. Cl. 222—176 **4 Claims**



1. A mortar layer for laying viscous mortar of a uniform width and thickness onto a surface comprising a body having an internal chamber with an upper viscous mortar storage region and two contiguous depending leg regions relatively spaced a predetermined distance, said leg regions extending into terminal openings disposed lateral to the direction of movement of the layer, a single flat surfaced agitator having an inverted V-shaped cross-section including arms and an apex, the apex disposed within the storage region of the chamber and one arms fo the agitator extending into each of said leg regions, for shaking the viscous mortar therein, means to activate the agitator, and means for moving the body along the surface and to constrain the terminal openings at a predetermined distance from the surface, such said viscous mortar of uniform thickness and width is deposited onto the surface as the layer passes over it.

3,887,115

PACKAGE FOR AN UNDERARM SPRAY PRODUCT

Tor Petterson, Palos Verdes Peninsula, Calif., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Nov. 29, 1973, Ser. No. 420,040

Int. Cl. B65d *83/14*

U.S. Cl. 222—402.13 **10 Claims**

1. A container-delivery device for an underarm spray product, comprising:

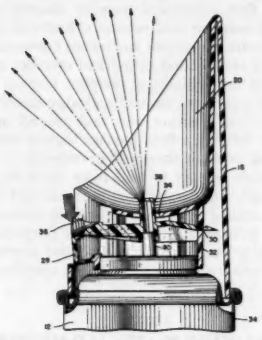
means to contain said product, said means having a lateral wall configured to be readily grasped in hand and a discharge port, said means defining an axis line;

conduit means connected with said port, extending from said container means and terminating in a spray orifice for discharge centered along a reference line which forms an acute angle with said axis line;

valve means to control the flow of said product through said spray orifice;

actuator means connected to said valve means; and

a head member connected to said container means and elongated in a direction along said axis line, said head including a surface which defines a passageway for and surrounds said spray orifice, said orifice being near the center of said surface, said surface terminating in an edge which defines a plane substantially normal to said reference line, said surface being concave whereby said spray



orifice is substantially recessed from said edge and said surface approximates a three-dimensional mirror image of the human axilla.

3,887,116

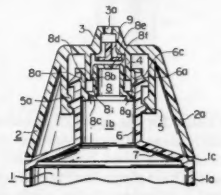
RECEPTACLE FOR LIQUID MATERIAL

Seiichi Ishikawa; Yooichi Miya, both of Tokyo; Ryoji Odate, Yokohama, and Yasui Kumai, Okegawa, all of Japan, assignors to Shiseido Co., Ltd., Japan

Continuation-in-part of Ser. No. 285,635, Sept. 1, 1972. This application Apr. 24, 1974, Ser. No. 463,848

Int. Cl. B67d *3/00*

U.S. Cl. 222—520 **6 Claims**



1. A dispenser for liquids comprising: a main body for containing liquid therein to be dispensed including an externally threaded cylindrical neck portion; a cap having an outer wall, an open end portion, a closed end portion having a centrally disposed first aperture therein, an inner cylindrical member disposed inside said can and fixed at one end thereof to said closed end portion about said first aperture and projecting from said closed end portion, an intermediate cylindrical member disposed inside said cap about said inner cylindrical member and fixed at one end thereof to said closed neck portion and projecting therefrom a greater distance than said inner cylindrical member and having an internally threaded portion engageable with said externally threaded neck portion, whereby said cap is movable toward and away from said neck portion in response to rotation thereof relative to said main body; means for preventing leakage of liquid to the external surface of said neck portion during use comprising a first cylindrical member, means fluidtightly mounting said first cylindrical member in said neck portion, a second cylindrical member having an open end portion and a closed end portion having at lease one second aperture therein and disposed coaxially within said first cylindrical member and spaced therefrom to define a cylindrical slot receiving said inner cylindrical member therein, means providing a fluidtight seal between said second cylindrical member and said inner cylindrical member comprising a ring shaped rib around the outer

surface of said second cylindrical member and projecting therefrom in engagement with the inner surface of said inner cylindrical member and urging said inner cylindrical member towards said first cylindrical member thereby providing a fluidtight seal between said second cylindrical member and said inner cylindrical member and means connecting the open end portion of said second cylindrical member and one end portion of said first cylindrical member and for providing a fluidtight seal therebetween; and a closure member disposed between said first aperture and said second aperture and having means defining a fluid passage therein and connected to said cap and movable therewith in response to the rotation of said cap with respect to said main body from a sealing position wherein said closure member seals said second aperture to a non-sealing position wherein said closure member is spaced apart from said second aperture permitting liquid in the main body to pass through said second aperture and said fluid passage and then through said first aperture.

3,887,117

SLIDE CLOSURE PLATES AND METHOD FOR PREVENTING MELT PENETRATION

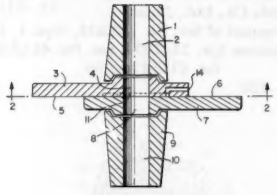
Hans Reinhard Fehling, Zug, Switzerland, assignor to Didier-Werke AG, Wiesbaden, Germany

Filed Apr. 19, 1974, Ser. No. 462,573

Claims priority, application United Kingdom, Apr. 27, 1973, 20118/73

Int. Cl. B22d *37/00*

U.S. Cl. 222—542 **6 Claims**



1. In a slide closure for the spout of liquid metal containing vessels, particularly large capacity steel-pouring vessels, such slide closure including a fixed bottom plate and a movable sliding plate, each of said plates having through-flow openings therethrough and contacting sliding surfaces, the improvement comprising:

a U-shaped channel in the sliding surface of said bottom plate around the through-flow opening thereof, the ends of the legs of said channel being spaced from each other by a distance greater than the diameter of the through-flow opening in said slide plate;

said slide plate through-flow opening, during sliding movement of said slide plate, being movable between said channel legs; and

means for supplying inert gas to said channel.

3,887,118

DEVICE FOR FORMING PLEATED CURTAINS

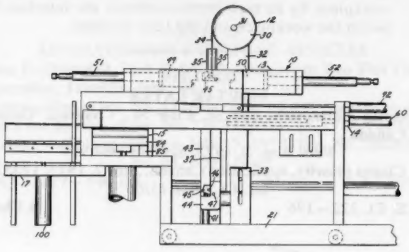
Stanley Levenstein, 50-01 Rockaway Beach Blvd., Far Rockaway, N.Y.

Filed Sept. 12, 1974, Ser. No. 505,476

Int. Cl. A41h *43/00;* **D06j** *1/00*

U.S. Cl. 223—28 **7 Claims**

1. A device for use in conjuction with a sewing machine for forming a plural fold pleat in piece goods along an edge thereof prior to a sewing operation permanently holding said formed pleat, in which one of said folds comprises a false pleat formed from a separate piece of material of a length less than the width of said piece goods, and inserted between folds formed in said piece goods, said device comprising: a frame element forming a supporting means, a fabric strip supply means carried by said frame element, fabric strip severing means receiving a continuous strip of material from said supply means, and cutting the same into predetermined lengths; means receiving said predetermined lengths and folding same longitudinally to form a finished false pleat, means received said finished false pleat and positioning the same at a pleat forming location; means forming multiple folds in said piece



goods at said location at periodic intervals therealong, said false pleat receiving means being selectively positionable between a pair of folds formed by said fold forming means to complete a composite pleat including actual folds and said false pleat in juxtaposed position, whereby said composite pleat may be manually removed from said fold forming means, and subsequently sewn together.

3,887,119

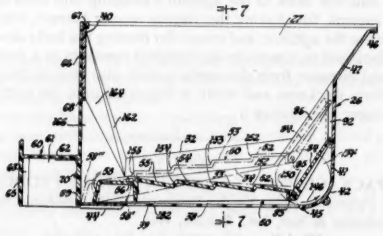
ICE DISPENSING DEVICE WITH OSCILLATING RAM

Jost S. Sucro, Dayton, and Louis D. Benasutti, Fairborn, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 30, 1973, Ser. No. 420,361

Int. Cl. G01f *11/00*

U.S. Cl. 222—247 **4 Claims**



1. An ice piece dispenser comprising; a container for receiving and storing ice pieces, said container including a front wall having a dispensing opening therein, a longitudinally extending trough formed in the bottom wall of said container with said trough having a planar substantially horizontally disposed base, an elongated ram disposed in said trough, said ram having a forward end face with its lower edge supported on said trough base for reciprocal movement thereon, said ram having its rearward end secured by a pivotal connection to eccentric drive means for movement of said pivotal connection in a circular path, a plurality of longitudinally spaced ice piece engaging steps formed on the upper surface of said ram, whereby eccentric movement of said pivotal connection, through rotation of said drive means, will cause said ram forward end face to move forwardly and rearwardly in a substantially horizontal path in said trough, forward travel of said ram causing said ice piece engaging steps to be raised out of said trough and into said container for advancing the ice

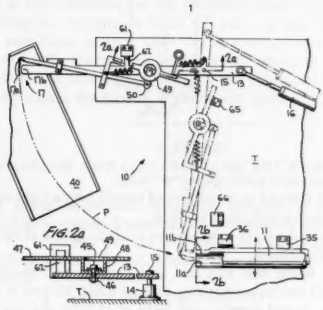
pieces toward said dispensing opening, said trough having a predetermined depth relative to said ram whereby said ice piece engaging steps are lowered from said container and into said trough during rearward travel of said ram, and passage means in said container forward wall allowing selected one or more of the ice pieces in said container to fall by gravity into the forward end of said trough during the rearward movement of said ram forward end face, whereby the subsequent forward travel of said ram forward end face pushes the selected ice piece or pieces in said trough through said dispensing opening.

3,887,120

HOSIERY HANDLING METHOD AND APPARATUS

John D. Harrill, Shelby, N.C., assignor to Marvel Specialty Company, Inc., Paducah, Ky.

Filed Sept. 25, 1974, Ser. No. 509,058
Int. Cl. A41h *43/00*
U.S. Cl. 223—43 **20 Claims**



10. A hosiery handling apparatus for turning, separating and stacking hose from a string comprising:

a hollow tubular form for receiving the hosiery string, said form having an open mouth forming one end,

a source of vacuum connected to the opposite end of said form to evert the first in-line hose through the mouth and into the form,

means for separating said hose from said string, and

means for pulling said hose off the open end of said form after eversion, whereby the hose is separated from said string and delivered away from said form along a predetermined path.

3,887,121

APPARATUS FOR TRANSFERRING FABRIC STRIP BETWEEN ENDLESS TRANSPORTER CHAINS

Rudolf Reich, 545 Neuwied, An-der Ringstr. 6, Germany

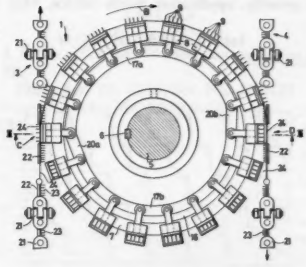
Filed Apr. 23, 1973, Ser. No. 353,664
Claims priority, application Germany, May 27, 1972, 2225970
Int. Cl. B65h *17/38*
U.S. Cl. 226—53 **8 Claims**

1. Apparatus for shuttle type embrodery machines for transferring a fabric strip from the pins of an endless fabric transporter chain to the pins of another endless fabric transporter chain comprising

a. a transfer disc with outwardly projecting pins,

b. fabric transporter chains which run in opposite directions to each other and have pins mounted on bars thereon

c. the pins being mounted so that at a point of contact between said transporter chains and said transfer disc two different pins engage the fabric strip adjacent to each other



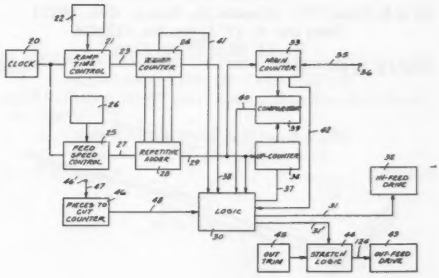
d. the transfer disc and the fabric transporter chains running at the same circumferential speed.

3,887,122

PRESS FEEDER CONTROL APPARATUS

Marcel R. Sommeria, Palos Heights, Ill., assignor to Hyper-Loop, Inc., Bridgeview, Ill.

Filed Jan. 2, 1973, Ser. No. 320,272
Int. Cl. B65h *17/22*
U.S. Cl. 226—136 **14 Claims**

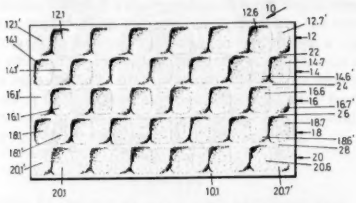


1. In apparatus for controlling the movement of a member from a first position to a second position including drive means operable in response to a train of pulses having a separate pulse for each increment of movement of said member, the combination comprising: a main counter, means presetting said main counter to manifest a quantity proportional to the distance between said first and second positions, generating means for generating a pulse train having a manually adjustable pulse repetition rate, means for connecting said pulse train to said main counter for decrementing said counter with each pulse of said pulse train, and means adapted for connecting said pulse train with said drive means, said generating means including means for varying the pulse repetition rate of said pulse train, decreasing said pulse repetition rate to substantially zero when said member reaches said second position.

3,887,123
PACKAGING ARRANGEMENT

Pieter Anthon Hattingh, Paarl, South Africa, assignor to Bakke Industries Limited, Dal Josafat, Paarl, South Africa

Filed May 23, 1973, Ser. No. 363,147
Claims priority, application South Africa, May 23, 1972, 72/3503
Int. Cl. B65d *1/00, 85/34*
U.S. Cl. 229—2.5 **10 Claims**

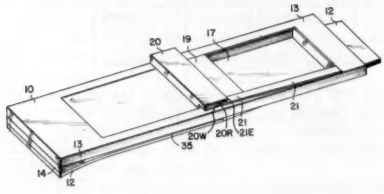


1. An apple packing tray for packing a plurality of apples comprising a generally rectangular sheet of generally non-stretchable, shock absorbent material with a general plane, the sheet being provided with a number of adjacent longitudinal substantially parallel rows of alternating uninterrupted pockets and caps displaced in opposite directions out of the general plane and arranged such that transverse rows of alternating pockets and caps are formed, the pockets and caps being of substantially similar shape and size, and each being shaped along a longitudinal section plane as a continuously circularly curved segment having a height, measured from the general plane to the top of a cap or bottom of a pocket, equal to substantially less than half its radius.

3,887,124
CONTAINER BOX CLOSURE

John E. Skau, 7913 Wyandot St., Denver, Colo. 80221

Filed Dec. 5, 1973, Ser. No. 422,524
Int. Cl. B65d *47/00, 83/00*
U.S. Cl. 229—7 SC **1 Claim**



1. A reusable one-piece closure assembly that may be readily installed on a conventional paperboard box to serve as a closable orifice of the box, comprising two members in the form of strips of material which are fastened together at a common end so as to clamp together a side of box lying between the two members when the inner member is pushed through a slit in the side of a box, with the exterior member fitted with a slidable door member to alternately open or close an orifice in the exterior member,

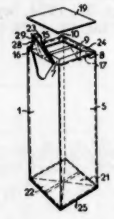
said slidable door member and said exterior member fitted with safety latch means to latch the slidable door member in the closed position of the slidable door member,

said safety latch means comprising a flexible flat spring strip, one end of which is mounted to the exterior surface of the exterior member to lie between the slidable door member and the exterior member in the open position of the slidable door member, with the other end of the spring strip member projecting, in the closed position of the slidable door member, into a recess in the exterior face of the slidable door member and against a wall of said recess, said slidable door member being freely slidable over said flat spring member when the flat spring member is manually depressed against the exterior member.

3,887,125
SEMI-RIGID IMPERVIOUS PACKAGE FOR LIQUID PRODUCTS

Joseph-Charles Trentesaux, Leers, Belgium, assignor to American Can Company, Greenwich, Conn.

Continuation-in-part of Ser. No. 228,021, Feb. 22, 1972, abandoned. This application Mar. 26, 1974, Ser. No. 454,836
Int. Cl. B65d *5/56, 25/14*
U.S. Cl. 229—7 R **3 Claims**



1. An impervious package comprising:

a container formed by a number of panels into a rigid enclosure of polygonal cross section;

a rigid cap and a rigid base sealing said enclosure at respective ends thereof;

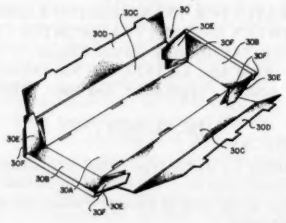
means for fixing said cap and said base to said enclosure ends, said means comprising at least a flap hinged to each cap end of said panels, said flaps at at least the cap end of the enclosure forming a flat continuous flange cross-bracing the enclosure, one panel having tear line perforations therein constituting, together with at least part of the hinge between said one panel and the related flap, a tab hinged to said enclosure and allowing partial opening of the container; and

at least one impermeable lining within the container, said lining comprising a flexible tube sealed at both ends which respectively correspond to the cap and base ends of the enclosure.

3,887,126
RECEPTACLE

James D. Wilson, Newport Beach, Calif., assignor to Banner Metals Division Intercole Automation, Inc., Compton, Calif.

Filed Mar. 4, 1974, Ser. No. 447,821
Int. Cl. B65d *5/22*
U.S. Cl. 229—34 R **2 Claims**



1. A rectangular receptacle formed of pasteboard, or the like, and intended to be supported in a tiered condition on wires on a wheeled rack, comprising: a first rectangular panel

forming a bottom for the receptacle and having a series of slots extending along each side thereof; a first pair of up-turned rectangular panels integral with the respective side edges of said first rectangular panel and forming sides for the receptacle; a second pair of down-turned rectangular panels integral with the respective outer side edges of the panels of the first pair and co-acting with the respective inner faces of the panels of the first pair; a series of projections integral with the outer side edge of each panel of the second pair extending into said slots to maintain the sides of the receptacle in an upright position; a third pair of up-turned rectangular panels integral with the respective end edges of said first rectangular panel and forming ends for the receptacle; a pair of side flaps integral with the respective end edges of each of the panels of the third pair and received between the panels of the first and second pairs to hold the panels of the third pair in an upright position; a fourth pair of down-turned panels integral with the outer edge of each panel of the third pair, a fifth pair of up-turned panels integral with the outer edge of each panel of the fourth pair and positioned between and in surface engagement with the panels of the fourth pair and the panels of the third pair to form handles for the receptacle and supports for suspending the receptacle from the wires of the wheeled rack, and end flaps integral with the end edges of each of these panels of the fourth pair and received between the panels of the first and second pair to hold the panels of the fifth pair turned within the panels of the fourth pair.

3,887,127

METHOD OF AND CONTROL CIRCUIT FOR ADMIXING AIR

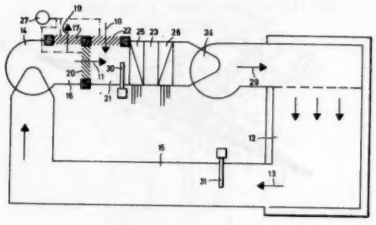
Fritz Jauss, Schonaich, Germany, assignor to Zentra Albert Burkle Kommanditgesellschaft, Schonaich, Germany

Filed Oct. 2, 1973, Ser. No. 402,922

Claims priority, application Germany, Oct. 2, 1972, 2248284

Int. Cl. F24f *11/00*

U.S. Cl. 236—91 **29 Claims**



1. An electric control circuit including means which sense an air heat-related parameter for generation of signals which influence position of a control member which regulates the admixing of outside air into recirculating air in ventilation or air conditioning systems where, during winter operation, the outside air portion of the mixture, starting with a first predetermined onset point, is smaller, the lower is the air heat-related sensed parameter; and where, during summer operation, the outside air portion of the mixture, starting with a second predetermined onset point, is smaller, the higher is the air heat-related sensed parameter; said electric control circuit comprising a first channel for winter operation and a second channel for summer operation, each of said channels being constantly operational, said first channel being responsive to said sensed heat-related parameter only below said first onset point for providing a first output signal, and said second channel being responsive to said sensed heat-related parameter only above said second onset point for providing a second output signal; means responsive to the output signals from said first channel and said second channel for adjusting the position of said control member; whereby the circuit function automatically changes between winter and summer operational modes as required without aid from any special switching device.

3,887,128

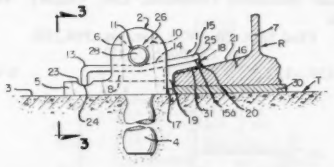
RAIL FASTENER

Emerson J. Ruble, Hinsdale, Ill., assignor to Portec, Inc., Oak Brook, Ill.

Filed June 13, 1974, Ser. No. 479,127

Int. Cl. E01b *9/48*

U.S. Cl. 238—349 **12 Claims**



1. A rail fastener for securing a rail base flange upon a crosstie, including, an anchor member fixed upon the upper surface of said crosstie adjacent the edge of said rail base flange, said anchor member provided with a pair of upstanding sidewalls, a longitudinally extending spring clip disposed between said sidewalls and having a rail section at one end overlying said rail base flange and a pivot arm section at the other end downwardly directed toward said crosstie upper surface, a cross pin overlying said clip and engaging said sidewalls to downwardly deflect said clip in an area intermediate said rail section and pivot arm section, a bridge spanning the upper portion of said anchor member sidewalls and said bridge having a bottom bearing surface against which the upper portion of said cross pin abuts.

3,887,129

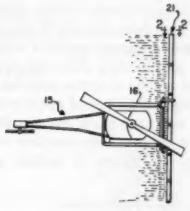
ACCESSORY ATTACHMENT FOR A VEHICLE USED FOR FLUID SPRAYING OF VEGETATION

Harold F. Brown, 10307 South Indian River Dr., Fort Pierce, Fla. 33450

Filed Apr. 19, 1974, Ser. No. 462,498

Int. Cl. B05b *15/02, 17/02, 1/30*

U.S. Cl. 239—119 **4 Claims**



1. In an apparatus connectable to a vehicle for spraying a fluid, the combination of:

a. an elongated boom having central supports for attachment to the vehicle and the boom having a rigid hollow strong front section that extends the full length of the beem with a plurality of keyed in shorter movable spraying sections in alignment and rearwardly of the front section, said front section carrying the fluid to be sprayed, said keyed in movable sections interconnectable in alignment and provided with valve means that is opened by the connecting movement of each section,

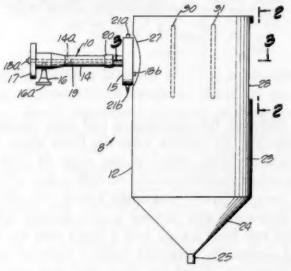
b. a fluid tube with a valve connected between the vehicle and the elongated boom to carry the fluid to be sprayed under pressure from the boom,

c. said movable spraying sections provided with a plurality of spray tubes laid in laminar formation and each movable section provided with inlet ports that are movable to an alignment position with the ports of the front section for spraying and movable out of alignment to stop spraying.

3,887,130
SULFUR PELLETIZING

William W. Chalmers, Calgary, Alberta, Canada, assignor to Canadian Occidental Petroleum, Ltd., Calgary, Alberta, Canada

Filed Sept. 20, 1973, Ser. No. 399,258
Int. Cl. B05b *15/00*
U.S. Cl. 239—132.5 **6 Claims**



1. A sulfur pelletizing gun having a barrel sealed at one end and a head with a back plate attached to the second end of said barrel, said barrel containing a coaxial conduit running the length of the barrel and defining a first chamber which is adapted to transport molten sulfur therethrough and a second chamber separate from, but adjacent to said first chamber adapted to transport a heating fluid therethrough which will supply sufficient heat to maintain the sulfur in said first chamber in a molten state, said barrel having first and second inlets in communication with said first and second chambers respectively and first and second outlets in communication with said first and second chambers respectively said head having a face plate opposite said back plate which is perpendicular to the central axis of the barrel, said head having sulfur and heating chambers in communication with said first and second outlets respectively for receiving molten sulfur and heating fluid respectively; said heating chamber being adjacent to said sulfur chamber so that heat from heating fluid passing through said heating chamber will maintain sulfur in said sulfur chamber in a molten state, said heating chamber having an outlet in said head, said head having a nozzle attached to said face plate, said nozzle having a plurality of apertures with central axes perpendicular to said face plate and parallel to the barrel's central axis, which are in communication with said sulfur chamber and through which jets of molten sulfur can be ejected.

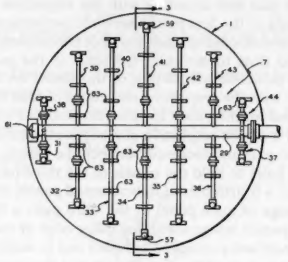
3,887,131
FLUID DISTRIBUTOR

Joseph R. Bourne, De Witt, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed May 31, 1974, Ser. No. 475,086
Int. Cl. B05b *1/20*
U.S. Cl. 239—110 **5 Claims**

1. Apparatus for distributing downwardly through an area a liquid in a mass transfer, counterflow relationship with a gas flowing upwardly through the area, said apparatus comprising: a generally horizontally disposed main header for receiving liquid to be distributed; and

a plurality of branch lateral lines extending transversely from said main header, said branch lateral lines each including:

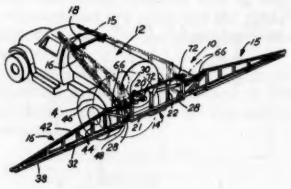


a generally horizontal portion joined at one end to said main header, said horizontal portion having a set of spaced ports for discharging liquid across said area; and a vertical riser at the other end of the horizontal portion for receiving surges of liquid flowing through said horizontal section.

3,887,132
BOOM ASSEMBLY

Gerald L. Widmer, 1176 Roselawn, Paxton, Ill. 60957

Filed Aug. 12, 1974, Ser. No. 496,629
Int. Cl. B05b *1/20*
U.S. Cl. 239—166 **12 Claims**



1. A spray boom assembly including frame means adapted to be mounted for transport on a vehicle, at least one spray boom, and mounting means mounting said spray boom to said frame means for movement both horizontally and in elevation between rigged-out and rigged-in positions, wherein the improvement in said assembly comprises:

urging means for urging said boom between said rigged-out and rigged-in positions,

movable lift link means for guiding said boom between said rigged-out and rigged-in positions and elevating said boom as said boom moves toward said rigged-in position, said lift link means comprising first and second rigid members,

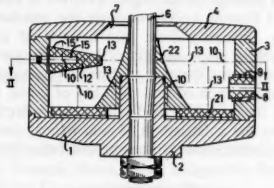
pivot means mounting one of said rigid members to said boom and to said other rigid member and mounting the other of said rigid members to said frame means, and

stop means to prevent the pivotal movement of at least one of said rigid members to effect elevation of said spray boom when said spray boom is moved by said urging means.

3,887,133
ATOMIZER WHEEL FOR THE ATOMIZATION OF SLURRIES

Orla Straarup, Copenhagen, and Paul Otto Gunther Helmich, Hillerod, both of Denmark, assignors to Aktieselskabet Nro Atomizer, Soborg, Denmark

Filed Dec. 17, 1973, Ser. No. 425,654
Claims priority, application United Kingdom, Dec. 18, 1972, 58419/72
Int. Cl. B05b *3/10*; **F23d** *11/08*; **B04b** *11/00*
U.S. Cl. 239—224 **11 Claims**

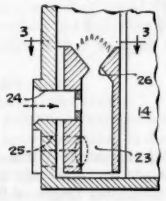


1. An atomizer wheel for the atomization of slurries, comprising a central hub, a substantially cylindrical side wall defining an annular bowl-shaped space concentric with said hub and being formed with a number of ejection orifices, a number of bushings of a wear-resistant material each of which is inserted in an individual one of said orifices so as to project with one end into said bowl-shaped space a distance from the inner side of the side wall and a number of spoke-like projections arranged in said bowl-shaped space with one end of each projection situated in the region between the side wall and the ends of said wear-resistant bushings facing the central hub.

3,887,134
GAS BURNER

David Solomon Hacker, Evanston, Ill., assignor to John Mohr & Sons, Chicago, Ill.

Filed Apr. 1, 1969, Ser. No. 811,988
Int. Cl. B05b *7/00*
U.S. Cl. 239—404 **3 Claims**

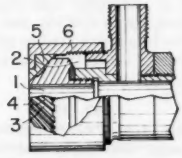


1. A regenerative stove burner assembly for low caloric fuel gas, said burner assembly including, in combination,
structure forming a burner chamber,
said burner chamber being elongated in an axial direction, and having an axial cross-section formed generally in the shape of a pair of adjacent, opposed circle segments,
a fuel gas inlet conduit,
a combustion air inlet conduit,
at least one of said inlet conduits opening into the burner chamber generally tangentially with respect to the circular arc of one of said circle segments,
said fuel gas and combustion air inlet conduits being disposed in opposed relation to one another to thereby provide intimate intermixing of said fuel gas and combustion air, and
said burner chamber terminating in a venturi shaped burner nozzle constructed and arranged to support a flame a short distance downstream from the most constricted portion of the nozzle,
said burner assembly being composed of ceramic material, whereby it may be located within a regenerative stove.

3,887,135
GAS-ATOMIZING NOZZLE BY SPIRALLY ROTATING GAS STREAM

Shigetake Tamai, No. 46488-90, Ikuta, Kawasaki-shi, Kanagawa, Japan

Filed Nov. 15, 1973, Ser. No. 416,148
Int. Cl. B05b *7/10*
U.S. Cl. 239—406 **2 Claims**

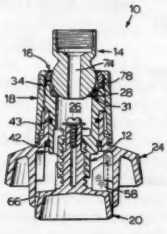


1. An air-atomizing nozzle comprising: a truncated main body forming a tapered surface of revolution, semi-spiral grooves being identical in form and configuration and symmetrically disposed at circumferentially spaced positions within the tapered surface of the body, a correspondingly tapered cover closely covering said grooved surface of the truncated body and forming semi-spiral air passageways, said truncated body having at its axis a passageway for liquid and said semi-spiral grooves being of such configuration that the focal point of said semi-spiral grooves on the tapered surface of the truncated body coincides with the imaginative apex or focal point of the main body, and wherein said semi-spiral grooves comprise grooves formed by transcribing on the tapered surface of the truncated body of the nozzle a pattern comprising a pair of stream lines on the sink side of a hydrodynamic dipole by plane projection and forming said semi-spiral grooves in conformance with the transcribed pattern at each circumferentially spaced groove location such that the focal point of the semi-spiral grooves coincides with the dipole sink point and with the axis of the truncated body.

3,887,136
ADJUSTABLE SHOWER HEAD

Leslie T. Anderson, London, Ontario, Canada, assignor to Emco Limited, London, Ontario, Canada

Filed July 8, 1974, Ser. No. 486,691
Claims priority, application Canada, Aug. 3, 1973, 178138
Int. Cl. B05b *1/18*
U.S. Cl. 239—460 **6 Claims**



1. A shower head comprising,
a. a body having a through passage therein for conveying a liquid to be sprayed,

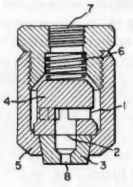
b. connector means for connecting said body to a source of fluid, said connector means having a through passage formed therein and terminating in a ball-shaped end, said through passage of said connector means opening into said through passage of said body,
c. a clamping collar,
d. a first seat on said clamping collar adapted to seat on a hemisphere of said ball-shaped end of said connector,
e. a second seat on said body adapted to seat on a hemisphere of said ball-shaped end,
f. a clamping member clamping said collar with respect to said body with said first seat and said second seat disposed on diametrically opposed sides of said ball-shaped end,
g. said clamping collar interlocking with said body to prevent rotation of said collar with respect to said body about a common axis of rotation, and
h. adjustable valve means mounted on said body for adjusting the character of the spray discharged from said head.

3,887,137

CENTRIFUGAL PRESSURE NOZZLE

Masayoshi Nakamura, Koshigaya; Tadayoshi Tamura, Yachiyo, and Sadao Toyoda, Funabashi, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Apr. 8, 1974, Ser. No. 458,768
Claims priority, application Japan, Apr. 13, 1973, 48-043791
Int. Cl. B05b *1/34*
U.S. Cl. 239—468 **5 Claims**



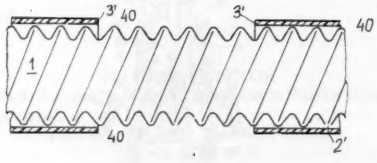
1. A spray nozzle having a swirl chamber constituted by a cylindrical hollow portion contiguous to a frusto-conical hollow portion, characterized in that several fluid inlets are provided so as to open in the swirl chamber, and the ratio A/A′ of the total sectional area A of the fluid inlets **1** to the sectional area A′ of the cylindrical hollow portion of the swirl chamber **2** is in the range of 0.5 to 1.0.

3,887,138

IRRIGATION DEVICE

Gideon Gilead, 5 Nicaragua St., Jerusalem, Israel

Filed Jan. 17, 1974, Ser. No. 434,193
Claims priority, application Israel, Jan. 17, 1973, 41342
Int. Cl. B05b *15/00*
U.S. Cl. 239—542 **8 Claims**



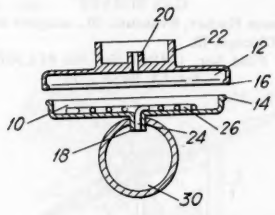
1. An irrigation device comprising:
an elongated continuous hollow hose for conveying fluid through the interior thereof and formed with a helical fluid flow passage of predetermined pitch between the inner and outer surfaces thereof, said helical passage having an axis substantially coaxial with the longitudinal axis of said hose;
a plurality of holes extending through said inner surface of said hose at predetermined spaced axial distances along said hose, each of said holes coupling the interior of said hose to said helical passage for fluid transmission therebetween;
a plurality of fluid discharge ports extending through said outer surface of said hose each being disposed a predetermined axial distance along said hose from a respective one of said holes in said inner surface and each coupling said helical passage to the region exterior of said hose;
whereby fluid flowing axially through the interior of said hose flows outwardly from said interior of said hose through each of said plurality of holes into said helical passage and thence through said helical passage for discharge through each of said plurality of ports, the fluid discharged from each of said ports being selectively determined by the axial length of said helical passage between respective adjacent ones of said holes and ports.

3,887,139

TRICKLE IRRIGATION EMITTER

Denis N. Pearce, Hornton, England, assignor to Illinois Tool Works Limited, Bucks, England

Filed May 17, 1974, Ser. No. 471,102
Int. Cl. B05b *15/00*
U.S. Cl. 239—542 **10 Claims**



1. An emitter for a trickle irrigation system comprising a housing defining a chamber and inlet and outlet ports opening into the chamber, and a substantial length of fine diameter tubing which has freedom to move in said chamber in response to flucuations of the pressure of fluid flowing through said tube and which lies within said chamber and connects to one only of the said inlet and outlet ports.

3,887,140

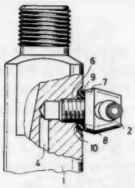
FUEL INJECTION ARRANGEMENT

Karl Hofmann, Aldingen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Jan. 21, 1974, Ser. No. 435,171
Claims priority, application Germany, Feb. 17, 1973, 2308001
Int. Cl. B05b *1/00, 15/06*
U.S. Cl. 239—600 **10 Claims**

1. A fuel injection arrangement for internal combustion engines comprising, in combination: a nozzle holder for hold-

ing a fuel injection nozzle, and a readily separable hose coupling member screwed into said nozzle holder, said coupling



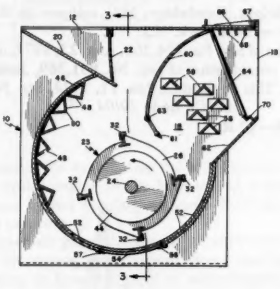
member being a screw nipple having at least one hosereceiving spout to which a hose may be removably connected.

3,887,141

IMPACT-ATTRITION MILL UTILIZING AIR FLOW

Peter M. Francis, Reno, Nev., assignor to Industrial Mining Machinery Corporation, Reno, Nev.

Filed Sept. 17, 1973, Ser. No. 397,662
Int. Cl. B02c *13/09*
U.S. Cl. 241—52 **8 Claims**



1. The improvement in a mill for the crushing, milling and classification of dry ore and other friable materials comprising the combination with a housing and a drive motor of the following:

an ore intake chute;

a fine particle outlet means;

a primary reduction chamber within said housing;

an impact rotor connected to the said motor nonconcentrically mounted within said primary reduction chamber such that upon rotation of said rotor an air flow is produced directionally from said intake chute through said primary reduction chamber to said fine particle outlet means;

a plurality of impact bars mounted upon said rotor, extending outward from the periphery of said rotor;

a secondary reduction chamber intermediate said primary reduction chamber and said fine particle outlet, and separated from the primary reduction chamber and the ore intake chute by a deflector wall terminating in a movable flap structure;

attrition means within said secondary reduction chamber, obstructing a straight line passage of particles from said primary reduction chamber to said outlet means;

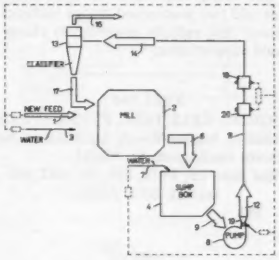
a plurality of elongated angular members depending inwardly from the walls of the primary reduction chamber, said members being so positioned as to provide impingement surfaces for particles driven by the said impact rotor, the longitudinal axes of said members being parallel with the axis of the said impact rotor.

3,887,142

ORE GRINDING CIRCUIT

Richard E. McElvain, 2916 Pelham Rd., Madison, Wis. 53713

Filed June 21, 1973, Ser. No. 372,034
Int. Cl. B02c *17/00*
U.S. Cl. 241—79 **5 Claims**



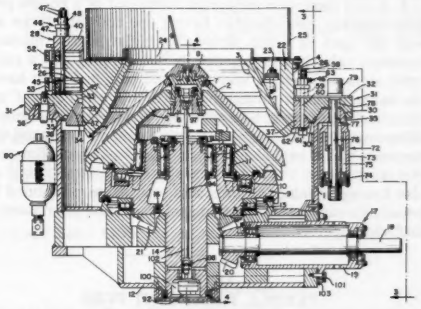
1. An ore grinding circuit comprising ore feeding means, ore grinding means, a sump, a centrifugal pump and a cyclone classifier connected in series so as to feed said classifier with a continuous flow of slurry by said pump and return the cyclone underflow to said grinding means, said pump and classifier being interconnected by a conduit line which in a vertically extending portion thereof includes a constricted section near said pump affording a solids re-entry zone wherein the slurry discharged from the pump is under the influence of the pump impeller's centrifugal force and linear velocity as developed within the pump.

3,887,143

GYRATORY CRUSHER

George T. Gilbert, Bayport, and Anton W. Chryst, Minneapolis, both of Minn., assignors to Portec, Inc., Oak Brook, Ill.

Filed May 28, 1974, Ser. No. 473,574
Int. Cl. B02c *2/04*
U.S. Cl. 241—215 **12 Claims**



1. A crusher including, a peripheral frame provided with an uppermost annular V-way, a conical crusher mantle mounted within said frame, a bowl assembly disposed above said mantle and including a cylindrical body having an outer cylindrical periphery of lesser diameter than said peripheral frame, an annular support ring surrounding said bowl body and vertically displaceable relative thereto, said support ring provided with a downwardly facing annular cavity mating with said frame V-way and adapted to be supported thereupon, said support ring having an inwardly facing wedge surface radially spaced from said bowl body outer periphery, a segmented bowl clamp ring surrounding said bowl assembly intermediate said outer periphery and said support ring wedge surface, said

segmented clamp ring having an outwardly facing wedge surface juxtaposed said support ring wedge surface, a plurality of bolts carried by each segment of said clamp ring and passing upwardly through said support ring, stop means on the upper distal portion of said bolts, fluid-actuated expansible means surrounding said bolts intermediate said stop means and said supporting ring whereby, actuation of said expansible means urges said clamp ring segments upwardly against said support ring as said two juxtaposed wedge surfaces force said segmented clamp ring radially inwardly to clamp said bowl assembly to said support ring.

3,887,144

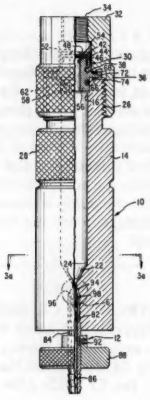
CYTOLOGICAL CELL DISRUPTION APPARATUS

Warren I. Schaeffer, Manor Woods Apartments, No. 28, Kennedy Dr., South Burlington, Vt. 05401

Filed June 25, 1974, Ser. No. 482,846

Int. Cl. B02s *19/00*

U.S. Cl. 241—301 **10 Claims**



1. A cell disruption apparatus comprised of a hollow pressure chamber, said chamber having one conical interior end wall the apex of which defines an outlet port; a manually operated valve having a generally conical plug and a rotary valve stem which seals said port, said plug and stem having discharge passages therethrough; the opposite end of said chamber being open; said chamber having exterior threads adjacent said open end; closure cap threadedly engaged with the open end of said chamber, said cap having a hollow interior receiving the end of a changeable filter assembly, said cap also having an inlet aperture; and seal means positioned between said cap and said filter assembly and said filter assembly and said chamber.

3,887,145

TEXTILE TREATMENT TUBE

Josef Egyptien, Aachen, and Walter Henning, Alsdorf-Begau, both of Germany, assignors to Messrs. Jos. Zimmermann, Aachen, Germany

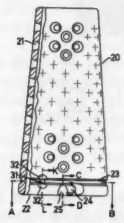
Filed Aug. 17, 1973, Ser. No. 389,424

Claims priority, application Germany, Aug. 24, 1972, 2241683

Int. Cl. B65h *75/28*

U.S. Cl. 242—125.1 **11 Claims**

1. A textile treatment tube comprising a casing having a thread holding device at its lower end, said thread holding device including at least one thread holding cantilever arm means mounted with an inner end at a distance from the lower edge of the tube on the outside of said casing and extending outwardly to its outer end substantially in the circumferential direction of the casing and a thread gripping depression provided in the casing circumferentially adjacent the inner end of



said cantilever arm means on the side of the arm opposite the direction in which the arm extends outwardly.

3,887,146

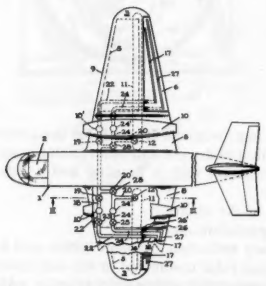
AIRCRAFT WITH COMBINATION STORED ENERGY AND ENGINE COMPRESSOR POWER SOURCE FOR AUGMENTATION OF LIFT, STABILITY, CONTROL AND PROPULSION

Cooper B. Bright, Cambridge, Md., assignor to Rutgers University, New Brunswick, N.J.

Continuation of Ser. No. 174,268, Aug. 23, 1971, abandoned, which is a continuation of Ser. No. 831,389, June 9, 1969, abandoned. This application Jan. 11, 1974, Ser. No. 432,489

Int. Cl. B64c *29/04, 15/14*

U.S. Cl. 244—12 R **19 Claims**



14. A V/STOL aircraft comprising an airframe, a source of fluid under pressure on said airframe, at least one structural element of said frame forming a fluid storage accumulator for storing fluid under pressure for limited duration use during landing and take-off at and below unaugmented power-on stall speeds, said source of fluid under pressure deriving said fluid from other than the exhaust gases from the aircraft's fuel combustion, first pilot-controlled valve means for supplying fluid under pressure from said source to said accumulator, second pilot-controlled valve means in the aircraft for supplying fluid under pressure from said accumulator and from said source for augmented wing lift for limited duration during landing and take-off at and below unaugmented power-on stall speeds by increasing the momentum of the boundary layer, said second pilot-controlled valve means directing fluid under pressure over surfaces of the aircraft for creating lift and aircraft stability control and for thrust for limited duration

during landing and take-off at and below unaugmented power-on stall speeds whereby the aircraft may perform short take-off and landing.

3,887,147

APPARATUS AND METHOD FOR AUGMENTING THE LIFT OF AN AIRCRAFT HAVING SHORT TAKE-OFF AND LANDING CAPABILITIES

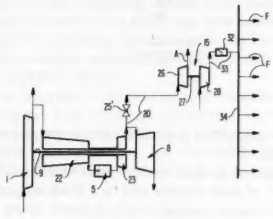
Hubert Grieb, Unterpfaffenhofen, Germany, assignor to Motoren-und Turbinen-Union Munchen GmbH, Germany

Filed Aug. 13, 1973, Ser. No. 387,639

Claims priority, application Germany, Aug. 12, 1972, 2239822

Int. Cl. B64c *21/04, 21/06*

U.S. Cl. 244—42 CC **39 Claims**



1. Apparatus for augmenting the lift of an aircraft having at least one cruise engine of the type having a plurality of turbines driven by hot combustion gases from the engine; said apparatus comprising:

compressed air generator means separate from said engine,

high lift means including air flow directing means for directing air flow energized by said compressed air generator means,

hot gas extraction means for extracting a portion of the hot gases from said engine at a position upstream of a low pressure one of said turbines,

and hot gas conducting means for conducting said portion of the hot gases to said compressed air generator means to drive said compressed air generator means,

wherein said at least one cruise engine is of multiple-spool, multiple-stream construction with said turbines being arranged in series with one another, and wherein said hot gas extraction means includes means for extracting said portion of the hot gases at a position intermediate the most downstream and the second most downstream of said turbines, said most downstream turbine being said low pressure one of said turbines.

39. A method of augmenting the lift of an aircraft having at least one cruise engine of the type having a plurality of turbines driven by hot combustion gases from the engine and of multiple-spool, multiple construction with said turbines arranged in series with one another; said method comprising:

extracting hot gases from said engine at a position intermediate the most downstream and the second most downstream of said turbines, said most downstream of said turbines being a low pressure one of said turbines,

driving compressed air generator means separate from said engine by directing said extracted hot gases thereto.

and energizing high lift means with said compressed air generator means effecting at least one of suction of boundary layer air from a wing means of said aircraft and exhausting of compressed air over the surface of said wing means.

3,887,148

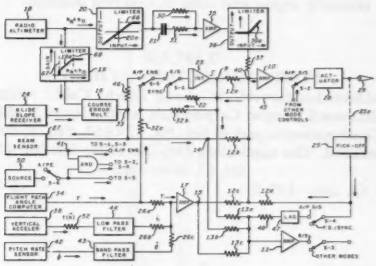
AIRCRAFT GLIDE SLOPE COUPLER AND LANDING SYSTEM

Bernard T. Devlin, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 19, 1973, Ser. No. 426,264

Int. Cl. B64c *13/18*

U.S. Cl. 244—77 A **7 Claims**



1. Apparatus for guiding a craft to a landing with respect to a radio defined path, comprising:

means for providing a first output signal representative of craft altitude above a landing surface,

flare computer means including first asymmetric limiter means and responsive to said first output signal for providing a second output signal only for a signal of predetermined input polarity,

second asymmetric limiter means responsive to said first output signal for producing a third output signal,

glide slope receiver means for producing a fourth output signal representative of the displacement of said craft from said radio defined path,

multiplier means for producing a product output signal proportional to the product of said third and fourth output signals,

flight path angle computer means for deriving a fifth output signal,

circuit means for combining said second, fifth, and product output signals for selective control of the attitude of said craft about the pitch axis thereof, said fifth output signal substantially reducing the effects of wind shear in the approach to landing.

3,887,149

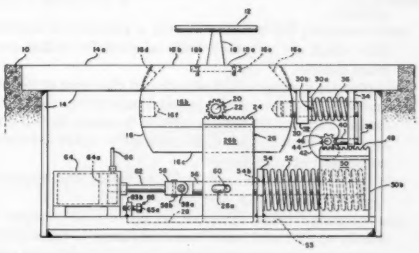
RETRACTABLE PENDANT SUPPORT

William J. Malinowski, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 2, 1974, Ser. No. 511,137

Int. Cl. B64f *1/02*

U.S. Cl. 244—110 C **4 Claims**



1. Apparatus for raising and lowering an aircraft arresting pendant from and to a runway surface comprising:

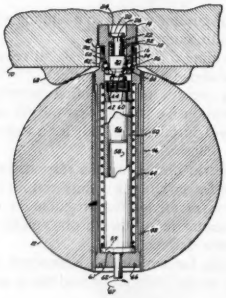
a rotatable table having first and second horizontal surfaces;
a pendant support secured to said first table surface;
motive means operatively connected to said table for pivoting said table between a first position wherein said first table surface is coplanar with said runway surface and a second position wherein said second table surface is coplanar with said runway surface;
bias means operatively connected to said motive means for normally urging said table to said first position.

3,887,150

INTERNAL EJECTOR MECHANISM

Thaddeus Jakubowski, Jr., Long Beach, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.

Continuation-in-part of Ser. No. 329,657, Feb. 5, 1973, abandoned. This application May 20, 1974, Ser. No. 471,670
Int. Cl. B64c *1/22*
U.S. Cl. 244—137 R **5 Claims**



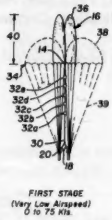
1. An internal ejector mechanism for releasably retaining a separable unit with a carrier unit, said mechanism comprising:
a disposable ejector cylinder attached to said separable unit,
a piston within said cylinder with a cartridge therein and a movable plunger actuator thereover,
said cylinder terminating in an annular ejector housing ring with an inwardly directed flange,
a mounting lug secured to said carrier unit, said lug having downwardly extending walls defining a mounting lug cylinder,
a ball retention plunger vertically movable within said mounting lug cylinder and of substantially the same diameter size as that of the inner diameter of said mounting lug cylinder,
said mounting lug cylinder having a plurality of openings into which are mounted balls adapted for radial movement therein,
said plunger having a shaft of reduced diameter at its lower end to permit inward movement of said balls, said plunger having a truncated conical portion between its two diameters for urging said balls outwardly upon downward movement of said plunger,
said balls fitting under said flange to retain said disposable ejector cylinder with said mounting lug,
said cartridge being operable to move said plunger upwardly to free said balls from said flange to separate said units whereupon on actuation of said cartridge said piston moves relatively to said mounting lug cylinder to unlatch said units and also to impart a separation force therebetween.

3,887,151

APPARATUS AND METHOD FOR CONTROLLING THE INFLATION TIME AND APPLIED SNATCH FORCES ON A PARACHUTE

Jon T. Matsuo, El Centro, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 28, 1973, Ser. No. 419,851
Int. Cl. B64d *17/34*
U.S. Cl. 244—152 **4 Claims**



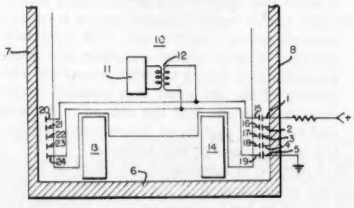
3. Anti-squid means for a parachute canopy comprising:
a control line;
attachment means at both ends of said line for connecting to the apex of said canopy and to a load, respectively;
a plurality of means intermittently located along said line for foreshortening the length of the control line;
said foreshortening means being releasable upon the application of a predetermined tensile force on said line;
each foreshortening means operable by different values of tensile forces;
whereby a sequential lengthening of said line can be achieved depending on the applied tensile forces.

3,887,152

AUTOMATIC VEHICLE PROTECTION SYSTEM

Roger Eblovi, Fairport, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Oct. 1, 1973, Ser. No. 402,415
Int. Cl. B61l *21/06*
U.S. Cl. 246—37 **7 Claims**

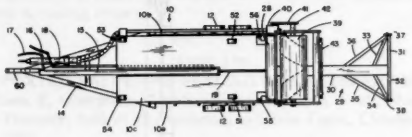


1. A vehicle detection and signaling system comprising,
a sectionalized signal rail supplied with energy of one type and with signaling energy different from energy of said one type,
and vehicle detection means connected to each section of said sectionalized signal rail and responsive only to energy of said one type,
vehicle carried means conductively engaging said signal rail and impedance means connected to said vehicle carried means, said impedance means providing a low impedance path to ground for energy of said one type.

3,887,153
ATTACHMENTS FOR UNLOADING DEVICES

Daniel W. O'Reilly, and Joseph D. O'Reilly, both of Rt. No. 3, Goodhue, Minn. 55027

Filed Nov. 5, 1973, Ser. No. 412,690
Int. Cl. A01c *19/00*; E01c *19/20*
U.S. Cl. 239—676 9 Claims

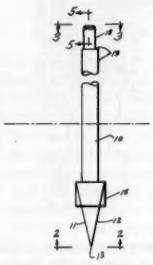


1. An attachment for the surface of an unloading device for unloading bulk material which has a tendency to adhere to the surface of the unloading device comprising:
   a container member for receiving bulk material and having means for confining the bulk material therein;
   a flexible member attached to said means for confining the bulk material therein;
   a pusher member mounted in said container member for forcing the bulk material out of said container member, said pusher member including a pliable scraper member for sliding along said flexible member to thereby clean the flexible member as the pusher member slides along said flexible member.

3,887,154
SUPPORT

John W. Cornett, 195 Minnick St., Franklin, Ohio 45005

Filed Feb. 15, 1974, Ser. No. 442,822
Int. Cl. A45f *3/44*; E02d *5/80*
U.S. Cl. 248—156 5 Claims

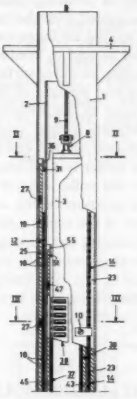


1. A support for an object such as a mail box, bird feeder, and the like comprising
   a hollow annular member having wall portions converging adjacent one end thereof and forming a chisel-like end and having
   a frusto-conical sleeve connected to said annular member and having an included angle between opposed wall portions thereof substantially corresponding to the angle included between said converging wall portions and having
   a pair of oppositely positioned ribs depending radially and outwardly from said sleeve, and
   a wick within said annular member adjacent said chisel-like end, said wick being supported by said latter member and extending outwardly therefrom through an opening therein to admit entry of liquid into said latter member and to effect removal of liquid therefrom by capillary action.

3,887,155
TELESCOPING SUPPORT MECHANISM

Silvio Bertalot, Malnata, Varese, Italy, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 7, 1973, Ser. No. 422,912
Claims priority, application Italy, Dec. 7, 1972, 23966/72
Int. Cl. F16c *19/00*
U.S. Cl. 248—333 7 Claims

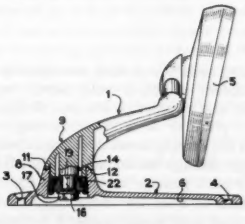


1. A telescoping support mechanism comprising an outer tublar member of substantially square cross-section, an inner tubular member of similar and smaller square cross-section adapted to slide telescopically within said first member with an annular space difined between said members with facing, spaced-apart inner and outer surfaces respectively of said outer and inner members on each of the four sides of said square, namely side A, opposite side AA, side B between sides A and AA, and side BB opposite side B, bearing means between said facing surfaces on each of said four sides, a race intermediate said bearing means and outer surface on sides A and B, spring means intermediate each of said races and said adjacent inner surface urging said race, adjacent bearing means, and outer surface on sides A and B into a non-backlash fit, and further urging said facing surfaces and intermediate bearing means of side AA into a non-backlash fit, side B having non-backlash means similar to side A with corresponding non-backlash fit on sides B and BB.

3,887,156
EXTERIOR DRIVING MIRROR FOR AN AUTOMOBILE VEHICLE

Charles Hugonnier, 93, Rue de Prony, 75 Paris, France

Filed Jan. 25, 1974, Ser. No. 436,811
Int. Cl. B60r *1/04*
U.S. Cl. 248—475 A 12 Claims



1. An exterior driving mirror for an automobile vehicle comprising a base for securing to a vehicle body, an arm

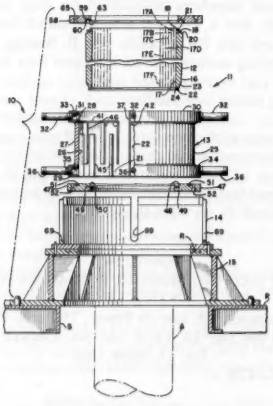
having a first end portion and a second end portion, a mirror mounted on said first end portion of the arm, the base having a socket defining a bore having a longitudinal axis, means for securing said second end portion of the arm to said socket in such manner that a blow on the arm of a predetermined magnitude causes release of the arm from the base, said means comprising a first abutment surface on the arm, a second abutment surface on the base, the first abutment and second abutment surfaces being in abutting relation axially of the bore when the arm is assembled with the base, a retaining ring of deformable material having an inner surface and an outer surface which is engaged in and in contact with the bore, a ring-expanding collar having an outer surface which is convergent toward said second end portion of the arm and coaxial with the bore and engaged in the ring in contact with said inner surface, means defining a rigid axial abutment for the ring in the bore adjacent said second end portion of the arm, an element securing the collar to said second end portion of the arm and exerting on the collar a force axially of the bore toward said second end portion of the arm and urging the convergent outer surface of the collar axially of the bore and the ring and thereby clamping the ring against the bore and radially compressing the ring and axially compressing the ring against said axial abutment, the ring being capable of elastically deforming and withdrawing from between the collar and the bore upon application of said blow.

3,887,157

CRYSTALLIZER MOLD

Charles J. Apatoczky, York, Pa., assignor to Teledyne, Inc., York, Pa.

Filed Aug. 9, 1973, Ser. No. 387,136
Int. Cl. B22d *27/04*
U.S. Cl. 249—79 **13 Claims**



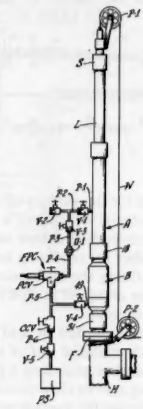
1. A crystallizing mold for cooling and shaping weld metal, comprising a coolant jacket, a weld metal engaging mold supported within said coolant jacket and defining with said coolant jacket a plurality of separate cooling zones, baffle means in each of the cooling zones defining a tortuous coolant fluid flow passage through each zone, coolant fluid inlet and outlet means for each passage to circulate the coolant fluid through each zone to cool the mold supported within the jacket and thus cool weld metal engaged by the mold, a pair of similar annular retaining rings secured to the upper and lower edges, respectively, of the jacket, and interengaging channel and wall means on said mold and retaining rings to accurately position and maintain said mold in said jacket.

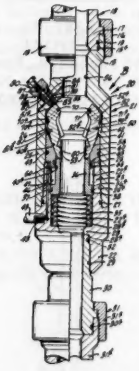
3,887,158

BLOW OUT PREVENTERS

Jodie E. Polk, Bukit Timah, Singapore, assignor to Otis Engineering Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 144,011, May 17, 1971, abandoned. This application Mar. 22, 1973, Ser. No. 343,652
Int. Cl. E21b *33/06*; **F16k** *31/363*
U.S. Cl. 251—1 **11 Claims**





1. A blowout preventer comprising: a body having a flow passage therethrough; a seat in the body surrounding the passage; closure means in the body movable between open and closed positions; tubular operating means in the flow passage of said housing connected with said closure means and movable in said housing for moving said closure means between open and closed positions; means biasing said operating means for moving said closure means to closed position; fluid pressure actuating means on said operating means and said body operable by control fluid pressure applied thereto for moving said closure means to open position, said biasing means moving said operating means to move said closure means to closed position automatically when control fluid pressure is relieved from said fluid pressure actuating means; means conducting control fluid pressure from a remote separate source of control fluid under pressure to said actuating means for causing movement of said closure means to open position; pilot control valve means communicating with the flow passage of said body on the downstream side of said closure means and with said means conducting control fluid to said actuating means and actuated responsive to a predetermined decrease in pressure in said housing on said down-

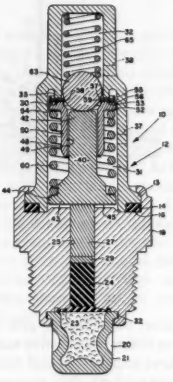
stream side of said closure means to relieve control fluid pressure from application to said actuating means to permit said biasing means to move the operating means to move the closure means to closed position; and check valve means in said means conducting control fluid pressure from said remote source to said actuating means between said remote source and said actuating means operable to cut off escape of control fluid pressure from said remote source when said pilot valve is actuated to relieve application of control fluid pressure to said actuating means.

3,887,159

PORTED VALVE AND SEALING MEANS THEREFOR

Frank E. Obermaier, Lombard, and Arthur A. Scott, Mount Prospect, both of Ill., assignors to Eaton Corp., Cleveland, Ohio

Filed May 21, 1973, Ser. No. 362,557
Int. Cl. F03g *7/06*
U.S. Cl. 251—11 **5 Claims**



1. A ported valve comprising:

a housing defined a configured chamber therein, and wherein said housing has an internal shoulder extending within aid chamber, said shoulder separating said chamber into said first and second portions and said shoulder is defined as an annular rib having an apex which defines a line of demarcation between said first and second chamber portions, said first chamber portion extending on one side of said shoulder and said second chamber portion extending on the other side thereof;

a first and second port spaced along said hosuing, said first port communicating with the first portion of said chamber and said second port communicating with a second portion of said chamber;

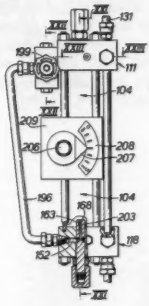
valving means within said chamber isolating said first portion of said chamber from said second portion in a firsts normally-closed position of said valve and providing communication between said first portion and said second portion in a second actuated position of said valve; said valving means including a resilient valve seat defined as an annular resilient disc within said first portion of said chamber and abutting said shoulder and having a central opening extending therethrough, a support member carrying said seat, said valve seat support member including an annular base portion approximately the size of said valve seat and a rim extending from the periphery of said base, said rim tapering inwardly over said base to retain said valve seat therein, first biasing means including a first spring within said first chamber portion biasing said seat into sealing engagement with said shoulder and contacting said support member to compress said seat into sealing engagement with said first and second portions of said chamber, a ball-type member normally positioned in contact with said opening and said seat, second biasing means contacting said valve member biasing into sealing engagement with said seat and actuating means to displace said valve member from said seat to provide communication between said first and second chamber portions.

3,887,160

FLUID OPERATED ACTUATOR FOR MOVABLE MEMBERS

John Cusveller, Moonee Ponds, Victoria, Australia, assignor to Sperry Rand Australia Limited, Victoria, Australia

Division of Ser. No. 73,508, Sept. 18, 1970, Pat. No. 3,688,644. This application Aug. 15, 1972, Ser. No. 280,879
Int. Cl. F16k *31/12*
U.S. Cl. 251—31 **27 Claims**

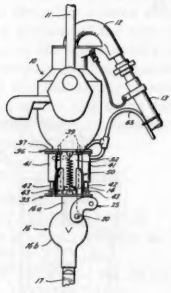


1. An actuator system including: a fluid operated actuator connectable to a member and being operable to cause movement of said member; said actuator including a cylinder and a force transmitting element which is movable axially within said cylinder under the influence of fluid pressure and is operatively connected to said member to be actuated; said force transmitting element dividing the interior of said cylinder transversely into two chambers; said cylinder having means operatively connected to both of said chambers whereby pressurized fluid may be introduced to or removed from either of said chambers through said means according to the desired direction of movement of the force transmitting element; a source of pressurized fluid; control means operable to connect said fluid source to a fluid circuit of said actuator to cause operation of the actuator; relief means connected into said fluid circuit and being operable to prevent the fluid pressure acting on said actuator from reaching a predetermined level; cut-off means operable to render the relief means inoperative when said actuator adopts a particular operative position but when in said operative position still permitting pressurized fluid to be introduced or exhausted from either cylinder chamber through said means connected to both of said chambers to enable continued operation of said actuator and movement of said force transmitting element and member; and indicator means connected to said fluid circuit so as to be operated when the pressure acting on said actuator reaches said predetermined pressure, and thereby indicates the operative position of said actuator and consequently the position of the said member connected thereto.

3,887,161
ARRANGEMENT FOR CLOSING A KELLY-COCK SUPPORTED ON A ROTARY SWIVEL WITH A STEM THEREFROM

Joseph R. Kubelka, Jr., 1100 Mary Lee St., Franklin, La. 70538

Filed Oct. 3, 1972, Ser. No. 294,663
Int. Cl. F16k *31/143*
U.S. Cl. 251—58 3 Claims



1. An arrangement for use with a swivel having a rotatable stem to remotely close a kelly-cock carried by the rotatable stem and wherein the kelly-cock includes a member having a longitudinal bore therethrough, a valve in the member for controlling flow through the bore, and projection means connected to the valve and extending externally of the kelly-cock for manual engagement to open and close the valve, the improvement comprising:

a. support means;

b. said support means comprising plate means carried by the swivel and guide means depending therefrom and surrounding at least a portion of the swivel stem;

c. means connected with the projection means externally of the kelly-cock for moving the valve in the kelly-cock to closed position;

d. driver means carried by said support means and movable relative to said support means for moving said means connected with the projection means externally of the kelly-cock to effect closing of the valve;

e. said driver means comprising:

1. engaging means to engage said means connected with said projection means; and

2. stabilizer means between said engaging means and said support means to aid in stabilizing said driver means as it moves; and

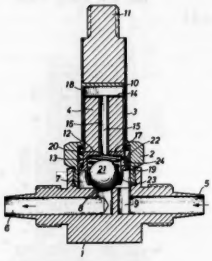
f. means to effect movement of said driver means relative to said support means; and

g. said means to effect movement of said driver means including fluid operated piston means and cylinder means with piston rod means connected to the piston means and the cylinder means and piston rod means being connected between said support means and driver means.

3,887,162
GLANDLESS SOLENOID VALVE FOR CORROSIVE MEDIA

Heinz Antoni, Leopoldshafen, and Carl Hans Leichsenring, Graben-Neudorf, both of Germany, assignors to Gesellschaft für Kernforschung GmbH, Karlsruhe, Germany

Filed May 14, 1973, Ser. No. 360,007
Claims priority, application Germany, May 26, 1972, 2225689
Int. Cl. F16k *31/06*
U.S. Cl. 251—129 6 Claims



1. A solenoid valve, including a valve body having means defining an inlet, an outlet and a valve seat disposed therebetween; a hollow sleeve attached to said valve body and extending therefrom; a solenoid winding surrounding the sleeve; a solenoid core accommodated in the sleeve at a location remote from the valve body; a solenoid armature movable within the sleeve; and a valve ball cooperating with the valve seat and actuated by the armature; the improvement comprising

a. a carrier slidably received in said sleeve for movement towards and away from said core, said carrier including

1. means defining an entirely closed first chamber adjacent said solenoid core, said solenoid armature being disposed entirely in said first chamber;

2. means defining a second chamber adjacent said valve seat, said valve ball being disposed in said second chamber;

3. wall means defining an opening in said second chamber, said opening being oriented towards said valve seat, said wall means retaining said valve ball in said second chamber;

4. a tube affixed to said means defining said first chamber, said tube maintaining communication between said second chamber and an interior part of said sleeve, said interior part being situated externally of said carrier and adjacent said first chamber;

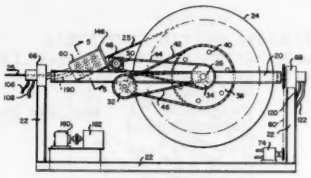
5. means defining, behind said valve ball, a connecting opening in said means defining said second chamber for maintaining a continuous communication between said second chamber and an inner space in said valve body adjacent said valve seat; and

b. spring means disposed in said second chamber for urging said valve ball into retaining engagement with said wall means, said valve ball having a portion protruding outwardly from said second chamber to cooperate with said valve seat.

3,887,163
APPARATUS FOR INSERTING CABLE OR THE LIKE IN CONDUITS

Charles J. Prange, Cridersville, Ohio, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Dec. 10, 1973, Ser. No. 423,437
Int. Cl. H02g 1/00
U.S. Cl. 254—134.3 FT **6 Claims**

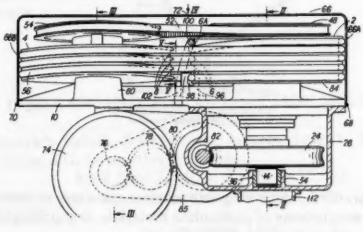


1. Apparatus for inserting rod into and retrieving rod from a conduit comprising a support structure, a carriage mounted on said support structure for rotation about a first axis, a reel rotatably mounted on said carriage for rotation about a second axis, a length of rod adapted to be wound on an unwound from said reel, rod drive means mounted on said carriage to feed said rod from said reel including rollers in driving engagement with said rod along a line tangent to the point where the rod diverges from said reel, guide means on said carriage adjacent to the side of said drive means from which the rod emerges when said rod is being fed from said reel to guide said rod in an arc of curvature whereby the run of said rod is changed in direction from said line of tangency to substantially the axis of rotation of said carriage, said arc of curvature having a larger radius than the arc of curvature of the rod when wound on the reel.

3,887,164
WINCH

William Charles Coombs, The Cottage, Wood Ln., Iver, Buckinghamshire, England

Continuation of Ser. No. 89,942, Nov. 16, 1970. This application Oct. 10, 1972, Ser. No. 295,973
Claims priority, application United Kingdom, Nov. 21, 1969, 57189/69The portion of the term of this patent subsequent to Aug. 14, 1990, has been disclaimed.
Int. Cl. B66d 1/74
U.S. Cl. 254—175.5 **3 Claims**

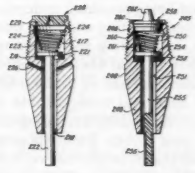


1. A power driven cable winch comprising in combination: a housing; first and second rotatable drums each having a periphery provided with cable-receiving tracks including a first dual-width track, the first drum having its axis set squarely in the housing and the second drum being separated therefrom by an intermediate space and having its axis offset in the housing such that cable passing between the drums in the tracks travels in a straight line; a worm and worm wheel drive by means of which the rotatable drums are rotated from a motor; a cable tensioning means constituted by a pressure plate combined with the first of the rotatable drums to form a final cable-receiving track; a cable entering and leaving the winch through said intermediate space in directions substantially normal to the axis of the first drum, the cable entering the winch tangent to the squarely-set first drum and winding more than one complete turn thereabout in said dual-width track and then passing multiple turns between and around both drums in said tracks and finally making a last turn in said final track against said cable tensioning means, said cable tensioning means being such as to act on constantly differing adjacent portions of the cable, said portions of the cable always being of the same length; and a metal casing supported by said housing and covering said drums, the inner surfaces of the casing being located adjacent to the peripheries of both drums and shaped to press lightly against the cable as it passes therearound with sufficient pressure to maintain the cable in the tracks.

3,887,165
WATERING VALVE FOR ANIMALS

Earl Clayton Thompson, 448 S. First St., Hewitt, Tex. 76643

Continuation-in-part of Ser. Nos. 99,154, Dec. 17, 1970, abandoned, and Ser. No. 161,532, July 12, 1971, Pat. No. 3,698,431. This application Oct. 13, 1972, Ser. No. 297,454
Int. Cl. F16k 1/16
U.S. Cl. 251—339 **8 Claims**



1. A water dispensing valve for animals comprising
an elongated housing; passage means extending longitudinally through said housing including a valve chamber and an outlet passage of smaller cross-section than said valve chamber communicating said valve chamber with the outlet end of the housing; transverse shoulder means between said valve chamber and outlet passage defining an annular valve seat;
a valve closure member comprising an elongated stem of smaller cross-section than that of said outlet passage, and a radially enlarged head for sealing engagement with said annular valve seat; said stem extending through said outlet passage and beyond the housing outlet end;
a frusto-conical shaped compression spring in said valve chamber for urging said closure member head into engagement with said valve seat;
at least two axially spaced, annular retaining groove means in said housing passage means for axially and radially retaining the larger end of said spring with its smaller end bearing on said closure head; the larger end of said spring having a normal diameter greater than the diameter of said retaining groove means, whereby said spring is urged into a selected one of said groove means for selective positioning of said spring relative to said housing.

3,887,166

MIXER

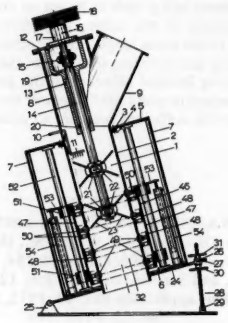
Christiaan Marie Van Ginneken, J.Obrechtlaan 14, Bussum, Netherlands

Filed Jan. 30, 1974, Ser. No. 437,951

Claims priority, application Netherlands, Nov. 27, 1973, 7316182

Int. Cl. B01f 7/04

U.S. Cl. 259—2 20 Claims



1. A mixer, comprising an elongated, substantially cylindrical, upright sleeve of flexible material, such as rubber, which forms the wall of a mixing chamber, a supply inlet for solid material debouching at the upper end of said sleeve, supply means for liquid being provided underneath said supply inlet, said sleeve accommodating a central mixing shaft coupled to a drive means, said mixing shaft bearing blade holders with blades fitted therein, said blade holders each being rotatable through 360° about an axis of rotation which is perpendicular to the mixing shaft and being fixable in any position by a locking member, said blades extending solely in the upper part of said sleeve and a free granulating space being situtated underneath said blades in said sleeve, deforming means being in contact with the outer surface of said sleeve and being displaceable by displacement means with respect to said sleeve in the longitudinal direction of the mixing shaft.

3,887,167

APPARATUS FOR MANUFACTURE OF ORGANIC ISOCYANATES

Carl F. Irwin, New Castle, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Division of Ser. No. 113,939, Feb. 9, 1971, which is a continuation-in-part of Ser. No. 846,210, July 30, 1969, abandoned, which is a continuation-in-part of Ser. No. 687,293, Dec. 1, 1967, abandoned. This application Feb. 22, 1973, Ser. No. 334,599

Int. Cl. B01f 7/04

U.S. Cl. 259—9 21 Claims

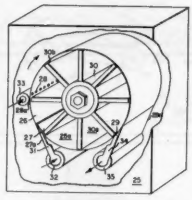
1. An apparatus for mixing fluids which comprises

1. a cylindrical vessel whose end walls and tubular side wall define a cylindrical chamber,

2. a rotor mounted for coaxial rotation within said chamber and having blades whose length is such that there is an annular space between the outer ends of the blades and the tubular inner wall of the vessel whose thickness is equal to about 0.1–20 percent of the diameter of said chamber during rotation of the rotor,

3. at least two inlet means for introducing fluids to be mixed into said annular space during rotation of the rotor, said inlet means comprising a first and second continuous feeding means capable of continuously feeding a fluid through said side wall into said annular space at a substantially uniform rate at numerous points along a narrow path in said side wall, said narrow path being about 80–100 percent as long as said wall and substantially parallel with the rotor axis, and

4. outlet means for removing mixed fluids from said annular space during rotation of the rotor, said outlet means



comprising an orifice means in said side wall located at an angular distance of about 135°–300° in the direction of rotor rotation from said second continuous feeding means.

3,887,168

MIXING APPARATUS

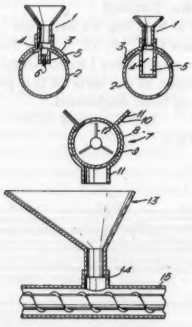
Frank Brooks, Atherton, England, assignor to Foscolor Limited, Lancashire, England

Filed Oct. 16, 1973, Ser. No. 407,032

Claims priority, application United Kingdom, Oct. 16, 1972, 47664/72

Int. Cl. B01f 9/08

U.S. Cl. 259—16 5 Claims



1. Apparatus for delivering to a receiver a mixture in predetermined proportions of particulate materials, comprising:

a source of each of the materials;

a mixing device;

metering means adapted at each actuation thereof to feed a measured quantity of each material from the respective source to the mixing device;

the mixing device comprising a cylinder and a rotary mixer blade therein, the cylinder having an opening in its wall and being rotatable about its axis between a first

position in which the opening is disposed adjacent said metering means to receive the measured quantities of materials from the metering means and a second position in which the opening is disposed adjacent said receiver to deliver the materials thereto;

and drive means for actuating the metering means, for moving the cylinder of the mixing device from its first to its second position, and for rotating the mixer blade during such movement.

3,887,169

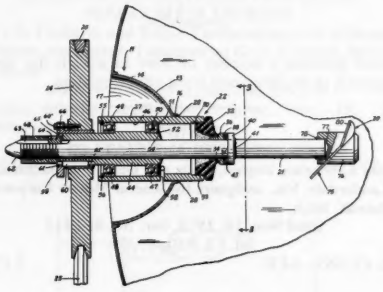
AGITATOR AND TANK APPARATUS

Frank L. Maynard, 2604 Weatherby, Springfield, Mo. 65807

Filed July 9, 1973, Ser. No. 377,660

Int. Cl. B01f *7/06*

U.S. Cl. 259—109 **7 Claims**



1. An agitator and tank apparatus comprising a tank having an annular vertical wall for containing a liquid to be mixed, an agitator having a rotating shaft and an impeller means mounted thereto, means for mounting the agitator in the vertical wall of the tank for rotation of the shaft and impeller means with the impeller means located within the tank and the axis of rotation of the impeller means being generally horizontal, means for rotating the shaft and impeller means in a direction to draw the liquid from the location of the tank opposite the mounting means and move it in a direction toward the mounting means, and deflection means between the impeller and mounting means for directing the impelled liquid outwardly in opposite directions around the annular wall of the tank to meet at the location of the tank opposite the mounting means.

3,887,170

INJECTION UNIT FOR AN INJECTION MOULDING MACHINE

Friedrich Heindl, Schwertberg, Austria, assignor to Ludwig Engel KG, Schwertberg, Austria

Filed June 7, 1974, Ser. No. 477,503

Claims priority, application Austria, June 19, 1973, 5404/73

Int. Cl. B29b *1/06*

U.S. Cl. 259—191 **3 Claims**

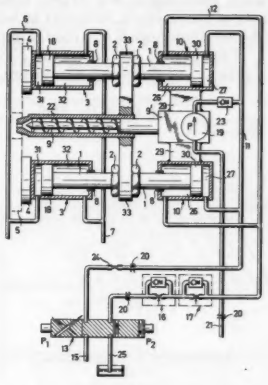
1. An injection unit for an injection moulding machine, in particular for processing thermoplastic materials, said unit comprising:

a rotatable screw which is disposed in an axially displaceable material cylinder and which is axially displaceable relative to said cylinder;

respective separate hydraulic cylinders for separately moving said cylinder and screw;

said cylinder being fixedly connected to bar members which are displaceable by first hydraulically actuated pistons operable within said hydraulic cylinders of said cylinder; and

said bar members having thereon second pistons which are



slidable within said cylinders of said screw, said cylinders of said screw being operatively connected to said screw.

3,887,171

APPARATUS FOR PURIFYING IN CONTINUOUS CASTING SILICON- AND/OR ALUMINIUM-KILLED STEEL

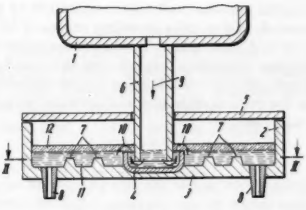
Herbert Neuhaus, Duisburg, Germany, assignor to Klöckner-Werke AG, Duisburg, Germany

Filed Nov. 28, 1973, Ser. No. 419,708

Claims priority, application Germany, Mar. 12, 1973, 2312137

Int. Cl. C21c *7/00*

U.S. Cl. 266—34 R **4 Claims**



1. Apparatus for purifying molten silicon- and/or aluminium-killed steel with the aid of a purifying slag upon the molten metal in a continuous casting process and disposed between the casting ladle and a continuous casting machine comprising:

a tundish,

a tube extending from the casting ladle into the tundish and

terminating just above the bottom of the tundish,

a trough in the bottom of the tundish,

a guidance for the molten metal defined by the tube and trough for directing the molten metal upwardly in soft touching contact with the purifying slag.

3,887,172

APPARATUS FOR THE TREATMENT OF A MOLTEN METAL BATH

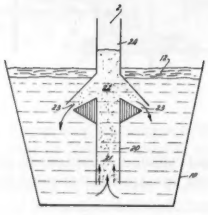
Alfred Funck, Differdange, and Arthur Schummer, Esch/Alzette, both of Luxembourg, assignors to Acieries Reunies de Burbach-Eich-Dudelange S.A. Arbed, Luxembourg

Filed Mar. 7, 1973, Ser. No. 338,668

Claims priority, application Luxembourg, Mar. 8, 1972, 64926

Int. Cl. C21c 7/00

U.S. Cl. 266—34 A 8 Claims



1. An apparatus for the treatment of molten metal in a bath thereof, comprising a receptacle receiving said bath of molten metal overlain by a slag layer; a circular-cross-section riser immersed in the molten metal and open at the bottom thereof; gas-injector means at the bottom of said riser for injecting gas into the molten metal and inducing an upward flow of a gas/metal mixture therein; a generally frustoconical decanting chamber on said riser at a location spaced above the bottom thereof and provided with a plurality of downwardly and outwardly trained radially extending nozzles for discharging molten metal into the melt upon separation of gas from the molten metal, said nozzles including angles of 30° to 55° with the axis of said riser; and a circular cross-section extension of said chamber extending through said layer and opening upwardly thereabove for discharging the gas separated from said mixture, the cross-section of said extension being greater than that of said riser.

3,887,173

BLAST FURNACE CONSTRUCTION

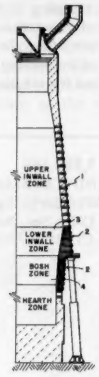
Berhl E. Wishon, Bethel Park, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 22, 1974, Ser. No. 435,550

Int. Cl. C21b 7/06

U.S. Cl. 266—43 6 Claims

1. In a blast furnace construction having an upper inwall zone, a lower inwall zone, a bosh zone and a hearth zone, a refractory lining in at least the lower inwall and bosh zones consisting essentially of a plurality of rows of refractory brick and a layer of pitch impregnated ceramic fiber board sandwiched between a number of rows to absorb the thermal expansion of the brick and resist attack by slags.



3,887,174

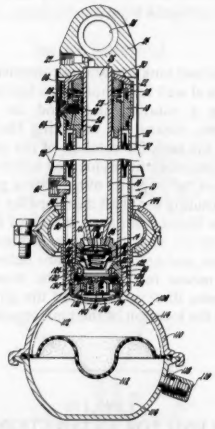
SHOCK ABSORBER AND LEVELER UNIT

James E. Whelan, Dayton, Ohio, and George W. Jackson, Fort Lauderdale, Fla., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 28, 1973, Ser. No. 419,515

Int. Cl. B60g 11/26

U.S. Cl. 267—64 R 4 Claims



1. A combination shock absorber and leveler unit for a vehicle comprising in combination a pressure cylinder operatively connected to a first vehicle mass, piston means mounted in said pressure cylinder, said piston means having a piston mounted for axial movement in said pressure cylinder and a piston rod connecting said piston to a second vehicle mass adapted to be leveled with respect to said first vehicle mass, a piston rod guide for said piston rod secured to one end of said pressure cylinder, inlet means for supplying hydraulic fluid to said pressure cylinder, an exhaust chamber, a hydraulic fluid discharge port for said exhaust chamber to exhaust hydraulic fluid from said unit, an exhaust-only valve operatively connected to said pressure cylinder for controlling the discharge of fluid from said pressure cylinder into said exhaust chamber

and into said discharge port, said exhaust-only valve comprising a valve element movably mounted in said piston rod guide between opened and closed positions, an actuator operatively connected to said piston means and disposed radially outwardly from one end of said valve responding to vehicle load condition to actuate said valve to maintain the vehicle at a substantially level height, said actuator having an internal wall disposed at differing distances from one end of said valve for effecting movement thereof, hydro-pneumatic accumulator means for accumulating hydraulic fluid fed to said unit and to provide an uplift force for said piston means to raise one of said vehicle masses with respect to the other of said vehicle masses, and auxiliary valve means operatively connecting said exhaust chamber to said unit to feed said unit with hydraulic fluid in response to operation of said unit when said unit demands a higher rate of hydraulic fluid flow from said accumulator means than can be provided by said accumulator means.

3,887,175

QUINIDINE ALGINATE AND PROCESS OF PREPARATION THEREOF

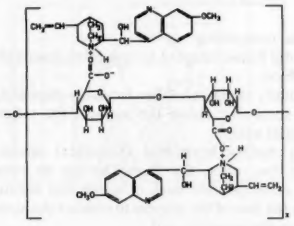
Pierre E. Cochard, and Roger Vandecauter, both of Brussels, Belgium, assignors to Laboratoires G.-A. Cochard, Brussels, Belgium

Filed Nov. 16, 1971, Ser. No. 199,219

Claims priority, application Belgium, Nov. 19, 1970, 96.509; Nov. 8, 1971, 110.261

Int. Cl. A61k *27/00*; **C08b** *19/10*

U.S. Cl. 260—209.6 **11 Claims**



1. Quinidine alginate.

11. The process of claim 7 wherein following settlement of the reaction product, the mixture is brought to a low temperature, separation is made by centrifugation and the product is then washed with chloroform.

3,887,176

SHEET COLLATOR

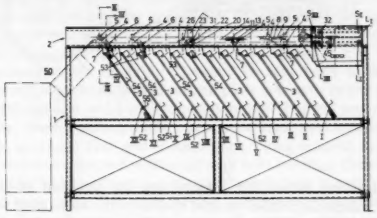
Jean Paulus, Anderlecht, and Christian Pierre Bourg, Hevillers, both of Belgium, assignors to C. P. Bourg, Belgium

Filed Dec. 12, 1972, Ser. No. 314,345

Int. Cl. B65h *39/02*

U.S. Cl. 270—58 **6 Claims**

1. In a sheet collator including a plurality of loading pockets arranged along a horizontal line between a head end and an outlet end of the collator with each pocket having an injection end, ejector rollers mounted in each loading pocket and engaging the top sheet of a packet of sheets therein to project, responsive to momentary activation of the ejector rollers, the top sheet partially out of its loading pocket, mounting means for the ejector rollers in each pocket, each mounting means including a rotatable roller shaft carrying the ejector rollers; an ejector drive shaft for the roller shaft, and a driving connection between the drive shaft and the roller shaft, ejector operating means operable to rotate the drive shaft, clutch means interposed between the operating means and the ejector drive shaft, and conveying means located at the ejection ends of and adjacent to the loading pockets for engaging each projected sheet to complete the withdrawal of the sheet from its pocket and to direct the sheet toward the outlet end of the collator: the improvement comprising, in combination, a respective ejector pinion mounted for free rotation one each ejector drive shaft and constituting said operating means, each ejector pinion having a hub portion; driving means operable to continuously rotate said ejector pinions; a respective spindle means secured to each drive shaft in coaxial alignment with the hub portion of the associated ejector pinion; each clutch means being contsituted by a respective helical spring having a number of turns fixedly embracing the associated spindle means and a number of turns embracing the hub portion of the associated ejector pinion, and biased to wind around such hub portion in a direction to tightly grip the hub portion to establish, in the tightened condition, a driving connection between the associated ejector pinion and the associated spindle for driving of the associated drive shaft; each helical spring having



a respective stop means on the turns thereof embracing the hub portion of the associated ejector pinion; and respective retainer means arranged in the path of movement of each stop means around the hub portion of the associated ejector pinion to engage the latter to retain the associated helical spring in a non-tightened condition for free rotation of the associated ejector pinion on the associated drive shaft; respective electro-mechanical operating means operable to retract each retainer means out of the path of the stop means of the associated helical spring for tightening of the associated helical spring to couple the associated ejector pinion to the associated drive shaft for conjoint rotation; and a sequencing electric switch device in controlling relation with said electro-mechanical operating means and operable to energize said electro-mechanical operating means momentarily and in seriatim, beginning with the electro-mechanical operating means of the first loading pocket adjacent the head end of said collator and continuing to the last loading pocket adjacent the outlet end of the collator.

3,887,177

SHEET FEEDING MECHANISM

Silvio T. Farfaglia, Fulton; Robert G. Halpin, Minetto, and Ronald E. Bock, Fulton, all of N.Y., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 7, 1973, Ser. No. 395,027

Int. Cl. B65h *3/08*, *5/02*

U.S. Cl. 271—12 **7 Claims**

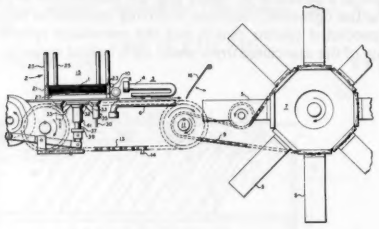
3. Apparatus for feeding discrete sheets which comprises a conveyor means having a conveyor run on which said sheets are to be transported and having means for engaging sheets deposited on said conveyor run;

a supply magazine means for containing a plurality of said sheets, means for mounting said supply magazine means over said conveyor run;

transfer means for successively withdrawing individual sheets from said supply magazine means and for depositing each thus withdrawn individual sheet on said conveyor run, said transfer means comprising at least one suction cup, means mounted beneath said conveyor run

adapted to move said at least one suction cup upwardly through said conveyor run into engaging contact with the bottom one of said sheets in said supply magazine means and then to return said at least one suction cup downwardly through said conveyor run to deposit the withdrawn sheet on said conveyor run, and means for maintaining a vacuum in said at least one suction cup from the time said at least one suction cup contacts the bottom sheet in said supply magazine to the time the withdrawn sheet is deposited on said conveyor run;

means for periodically activating said conveyor means, and means for reciprocating said at least one suction cup to withdraw the bottom one of said sheets in said supply magazine means; and



holding means for maintaining the position of the thus deposited sheet on said conveyor run until after said thus deposited sheet is contacted by said means for engaging, said holding means comprising first and second hold-down means positioned to engage the upper surfaces of opposite edges of the sheet being deposited on said conveyor run; each said hold-down means comprising a first shaft, a hold-down bar, means mounting said hold-down bar on said first shaft for rotation therewith, a second shaft, means for longitudinally moving said second shaft responsive to the vertical movement of said at least one suction cup, and means responsive to the longitudinal movement of said second shaft for rotating said first shaft and the associated hold-down bar.

3,887,178

SHEET FEEDING ASSEMBLY INCLUDING AUTOMATIC STACK REPLACEMENT AND ALIGNING MEANS

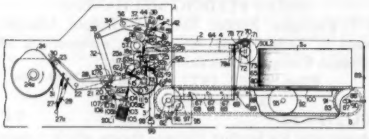
Sakae Fujimoto, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed July 9, 1973, Ser. No. 377,381

Claims priority, application Japan, July 24, 1972, 47-73924

Int. Cl. B65h *3/08*

U.S. Cl. 271—30 R **13 Claims**



1. In a sheet feeding apparatus having a tray supporting a first stack of sheets and a feeding mechanism for removing sheets from the stack on the tray and feeding the sheets out of the apparatus one at a time, the improvement comprising:

elevating means for continuously raising the tray from a bottom position as the feeding mechanism feeds out the sheets so that the successive top sheets of the first stack are maintained substantially at a predetermined height and for lowering the tray to the bottom position when the last sheet has been fed out;

sensing means disposed at the tray for sensing when the last sheet of the first stack has been fed out by the feeding mechanism and for generating a signal indicative thereof;

conveyor means arranged adjacent to the tray for supporting a second stack of sheets, and being responsive to said signal to move the second stack of sheets to the tray to be fed out; and

alignment means for urging and aligning side edges and rearward edges of the stack of sheets on the tray, and being responsive to said signal to clear the path of movement of the second stack of sheets while they are being moved to the tray.

3,887,179

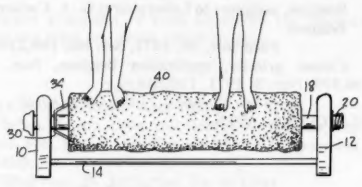
LOG ROLLING APPARATUS WITH ADJUSTABLE FRICTION STRUCTURE

John T. Klepper, and George Morse, both of 3303 Quinlan St., Yorktown Heights, N.Y. 10591

Filed Oct. 19, 1973, Ser. No. 408,121

Int. Cl. A63b *23/06*

U.S. Cl. 272—1 E **1 Claim**



1. A game comprising:

a horizontal frame adapted to rest upon a suitable horizontal surface;

a horizontally elongated roller rotatably disposed about the frame somewhat above the surface, the roller having a horizontal axle;

a spongy hollow horizontal cylindrical sleeve disposed around the roller, the sleeve having an outer surface which resembles the bark of a tree and is roughened to enable the feet of the players to contact the sleeve surface in a non-slip manner; and

means to adjust the rotational friction of the roller in the frame to adjust the force required to rotate the roller, the rotational friction adjustment means including a disc having a hole through which one end of the axle extends, spring loaded manually operable means to move the disc along the axle toward or away from one end of the frame and a plurality of arms secured at one end to the disc and having opposite ends engaging suitable supports disposed in the one roller end, the arms and supports being symmetrically disposed about the axle.

3,887,180

EXERCISE APPARATUS FOR BEDRIDDEN PATIENTS

Bernard H. Berman, 685 N. Wade Ave., Washington, Pa. 15301

Division of Ser. No. 313,193, Dec. 7, 1973, abandoned. This application July 8, 1974, Ser. No. 486,329

Int. Cl. A63b *23/04*

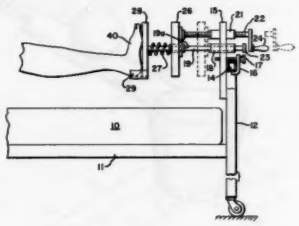
U.S. Cl. 272—58 **7 Claims**

1. An exercise apparatus for use in combination with a hospital patient's bed or the like having an end frame whereby a patient situated in the bed undergoes active exercise of distal extremities, comprising:

a mounting plate including means for attachment to said end frame,

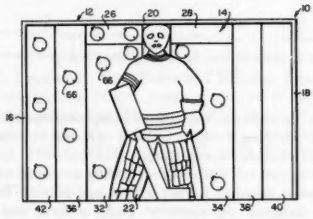
a platen adapted to be vertically disposed above the patient-bearing surface of said bed, board means for engagement with the feet of a patient occupying said bed to undergo

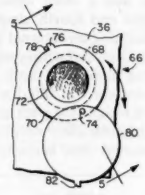
active exercise and movable by said patient from a rest position with respect to said platen, resilient means projecting from said platen for biasing said board means away from said end frame and parallel to the patient bearing surface of said bed and,



means for horizontally displacing said platen relative to said mounting plate and relative to the rest position of said board means.

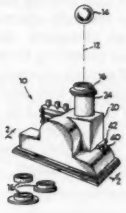
3,887,181
GOAL SHIELD
John Samaras, 983 Memorial Dr., Cambridge, Mass. 02139
Filed Oct. 13, 1972, Ser. No. 297,293
Int. Cl. A63b *69/00*
U.S. Cl. 273—1 B **4 Claims**





1. A goal shield comprising:
a. a frame having a substantially U-shaped profile in cross section, said frame including a pair of side members and a top cross member;
b. a body coplanar with said frame, said body including first, second, third, fourth, and fifth panels;
c. a plurality of fastening means mounted to said frame and said body, said fastening means including first, second and third members, said third member adapted to readily engage and disengage said first and second members, said first member detachably mounted to said second member when said first and second members are engaged by said third member;
d. said first panel connected to one of said side members, said top cross member, and said second panel;
e. said second panel connected to said top cross member, said first panel, said third panel, and said fourth panel;
f. said third panel connected to said top cross member, said second panel, said fifth panel;
g. said fourth panel connected to said second panel and said fifth panel;
h. said fifth panel in the form of a hockey goal keeper, said fifth panel detachably connected to said top cross member, said third panel, and said fourth panel;
i. at least two of said first members mounted on each said first, second and third panels, at least one of said first members mounted on adjacent sides of each said first, second and third panels;
j. at least two of said second members mounted on said frame, at least one second member mounted on one of said side members and on said top cross member;
k. a first plate rotatably mounted to said body at a forward face thereof, said first plate rotatably between a first position and a second position, said body formed with a through hole, said through hole covered by said first plate when said first plate is in said first position, said through hole exposed when said first plate is in said second position; and
l. a second plate rotatably mounted to said body at the forward face thereof, said second plate rotatable between a first position and a second position, said first and second plates having substantially circular profiles, said through hole and said first and second plate being coaxial, said second plate formed with a through hole having a diameter less than the diameter of said through hole formed in said body, said first plate having a diameter larger than said through hole formed in said second plate, said through hole formed in said second plate covered when said first plate is in said first position and exposed when said first plate is in said second position, a portion of said through hole formed in said body covered when said first plate is in said second position and said second plate is in said first position, all of said through hole formed in said body exposed when said first plate is in said second position and said second plate is in said second position.

3,887,182
FLUID STREAM GAME APPARATUS
Jeffrey D. Breslow, Highland Park, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.
Filed Dec. 10, 1973, Ser. No. 423,102
Int. Cl. A63f *9/00*
U.S. Cl. 273—1 E **12 Claims**



9. A game apparatus comprising:
a housing having an air blower mounted therein and a nozzle formed thereon for directing an air stream generally upwardly from the air blower;
a lightweight spherical ball which is supportable over the nozzle by the force of the air stream; and
a plurality of manually stackable playing pieces each having a generally flat ring-shaped annular fluid blocking portion, the annular width of the fluid blocking portions of certain playing pieces being of different widths, a generally centrally located opening defined by the interior

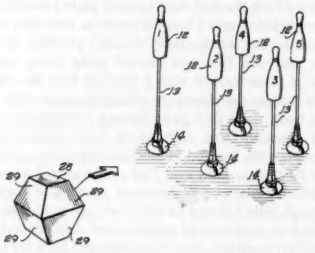
periphery of said fluid blocking portion through which the air stream can pass when the playing pieces are properly stacked on top of said nozzle, an upstanding cylindrically-shaped stacking portion formed on the fluid blocking portion and surrounding said openings so that the stacking portions of the plurality of stacked playing pieces form a hollow cylinder and define an air stream path of travel when said stack of playing pieces is supported on the nozzle, whereby said ball is caused to fall whenever the fluid blocking portion of a playing piece is interposed a sufficient length of time between the nozzle and the ball thereby interrupting the fluid stream when the playing pieces are moved to stacking position.

3,887,183

MODIFIED BOWLING GAME AND APPARATUS THEREFOR

Martin P. Saso, 7S510 Route 83, Clarendon Hill, Ill. 60514

Substitute for Ser. No. 315,440, Dec. 15, 1972, abandoned.
This application Apr. 24, 1974, Ser. No. 463,664
Int. Cl. A63b *67/00*
U.S. Cl. 273—41 **6 Claims**



1. Game apparatus for playing a modified bowling game of the kind wherein projectiles are manually tossed and directed toward a plurality of targets arranged in a predetermined pattern on a substantially flat and smooth playing field area surface from a position horizontally spaced from the targets in an attempt to strike the same, comprising, a projectile; and a plurality of target assemblies, each of said target assemblies including a target having a configuration substantially resembling one vertical half of a bowling pin, said target being made of relatively lightweight non-metallic material, and means for supporting said target on said playing field area surface in a generally upright position vertically spaced above said playing area surface including an elongated, slender rod having a relatively long end section extending from one end of the rod and a relatively short end section extending from the opposite end of the rod, means for attaching said target to said relatively long end section of said rod, and an enlarged base member connected to said relatively short end section of said rod, said base member being detachably connectible to said playing field area surface solely by vacuum.

3,887,184

HAND-HELD AND MANIPULATED CATCH BALL GAME

Joseph Cavaliere, 276 E. 24th St., Paterson, N.J. 07514

Filed Jan. 18, 1974, Ser. No. 434,388
Int. Cl. A63b *71/02*
U.S. Cl. 273—96 R **2 Claims**

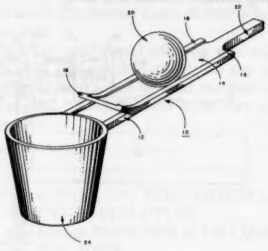
1. A hand held and manipulated catch ball game assembly comprising:

a support;

a ball launching ramp attached to said support;

said ramp having ball retaining side walls and an upturned ball launching end;

a ball receiving receptical attached to said support adjacent to said upturned end; and a handle attached to said support opposite said upturned ramp end for manipulating said assembly to launch said ball into said receptacle, said handle, said ramp and said ball receiving receptacle



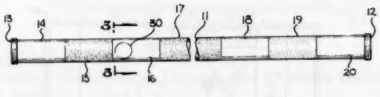
aligned along the longitudinal axis of said ramp, said ball receiving receptacle having a ball receiving opening whose axis is perpendicular to the longitudinal ramp axis.

3,887,185

TILTING TUBE WITH ROLLING MEMBER GAME

Patrick M. Landreville, 1352 W. Gwava, Oxnard, Calif. 93030

Filed July 19, 1974, Ser. No. 490,111
Int. Cl. A63f *7/04*
U.S. Cl. 273—109 **8 Claims**



1. A hand-held device capable of being employed as a game of skill and a testing device requiring sight-hand coordination and manual dexterity comprising:

a. an elongated tubular member having enclosed ends, said elongated member having a first and second clear sections disposed on opposite ends, a first and second opaque section disposed inwardly and adjacent said first and second clear sections, third and foruth clear sections disposed inwardly and adjacent said first and second opaque sections and a third opaque section disposed between said third and fourth clear sections, said elongated member defining an internal path; and,

b. a movable means disposed within said elongated member capable of moving along said path;

whereby said device can be tilted causing said movable means to move through said path and appear alternately in said third and fourth clear sections without appearing in said first or second clear sections.

3,887,186

BROADHEAD

Oscar N. Matlock, Jr., Pine Bluff, Ark., assignor to Brunswick Corporation, Skokie, Ill.

Filed Feb. 19, 1974, Ser. No. 443,311
Int. Cl. F41b *5/02*
U.S. Cl. 273—106.5 B **10 Claims**

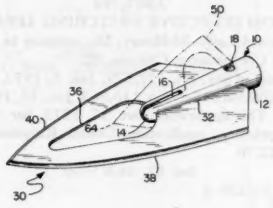
9. An arrowhead comprising:

a ferrule having a conical body with a rounded tip on the forward end of said ferrule, a planar slot in said ferrule extending rearward from the forward end of said ferrule into said conical body, and a pair of circular holes located on opposite sides of said conical body, the center of said circular holes being coplanar with said planar slot;

a flat primary blade securely brazed on the outside of said conical body, said main blade lying in a plane substantially perpendicular to that of said planar slot, and extend-

ing forward well beyond said rounded tip, said primary blade having an opening in the portion of said main blade which projects beyond said rounded tip; and

a flat auxiliary blade having a forward portion thereof positioned within said planar slot, said forward portion extending forward beyond said rounded tip and terminating in a pointed tip located within said primary blade opening, said auxiliary blade having a pair of fastening members, one of which is adapted to fit in each of said circular holes.



3,887,187

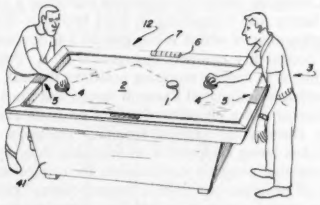
AIR CUSHION TABLE GAME

Phillip E. Crossman, Ada; Robert C. Kenrick, Grand Haven, and Robert W. Le Mieux, Spring Lake, all of Mich., assignors to Brunswick Corporation, Skokie, Ill.

Division of Ser. No. 179,659, Sept. 13, 1971, Pat. No. 3,773,325. This application Sept. 17, 1973, Ser. No. 397,694

Int. Cl. A63f *3/00*

U.S. Cl. 273—126 A **14 Claims**



6. A game comprising, in combination:

an air bed having means for creating an air cushion above a playing surface,

a bumper strip defining a boundary of the playing surface upon said air bed,

a game piece having an area and weight such that it floats upon said air cushion during play and is capable of moving over the playing surface generally without touching it, a goal associated with the playing surface, and

means for engaging said game piece so as to cause it to move upon said air cushion and over said playing surface.

3,887,188

PRACTICE HOCKEY PUCK OF FELT MATERIAL

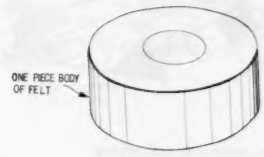
Gerald J. Beauchamp, Beloeil, Quebec, and Thomas A. Kelly, Pointe Claire, Quebec, both of Canada, assignors to Beaukel, Ltd., Quebec, Canada

Filed Nov. 27, 1973, Ser. No. 419,447

Claims priority, application Canada, Nov. 30, 1972, 157889

Int. Cl. A63b *71/00*

U.S. Cl. 273—128 R **6 Claims**



1. A hockey puck suitable for practice on non-ice smooth surfaces, said puck having substantially the size and shape as a conventional hockey puck and including a cylindrical body of felt and a ballast weight within said body, the diameter of said cylindrical body being greater than its height.

3,887,189

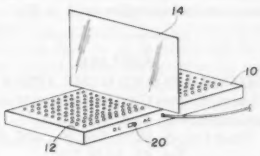
WORD BOARD GAME

Milton Dawes, 3415 Girouard, Apt. 1010, Montreal 236, Quebec, Canada

Filed June 8, 1973, Ser. No. 368,113

Int. Cl. A63f *3/00*

U.S. Cl. 273—130 AB **5 Claims**



1. A two person word game comprising:

a game board having two like horizontal sections divided by a vertical partition disposed therebetween and extending upwards therefrom, each section having a like number of lamp socket receiving positions arranged in rows and columns, there being at least twenty seven such positions, each section having a single letter of the alphabet disposed adjacent each position and associated therewith, there being more positions than letters of the alphabet whereby at least some of the letters are associated with more than one position;

a plurality of sockets equal in number to said positions, each socket being disposed at a corresponding position;

means connecting each socket on one section in series with a corresponding socket in the other section to form a corresponding series circuit;

means connecting all of said circuits electrically in parallel;

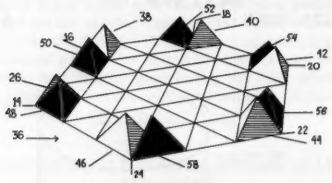
means to supply electric power to said parallel connected circuits; and

a plurality of lamps, at least some lamps being removable, disposed in sockets in both sections.

3,887,190
BOARD GAME APPARATUS

Victor H. Ameri, 33 Elm Ave., Mill Valley, Calif. 94941

Filed July 26, 1973, Ser. No. 382,739
Int. Cl. A63f 3/00
U.S. Cl. 273—131 L 1 Claim



1. A game apparatus comprising:

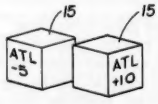
a board having markings thereon defining a plurality of fifty four equilateral congruent board triangles, each being contiguous on at least two sides with other board triangles; said plurality of triangles defining a hexagonal configuration, and

a plurality of four-sided playing members, each side of each playing member defining an equilateral triangle congruent with the triangle defined by each other side of that playing member, and congruent with the triangle defined by each side of each other playing member, and congruent with each of the plurality of board triangles, each playing member having a triangular side positioned on a board triangle to cover and conform to said triangle, each playing member being movable by rotation of that playing member generally about one leg of the triangle defined by the side of the playing member positioned on the playing surface into an unoccupied area of the playing surface, until another triangular side of the playing member is seated on the playing surface and wherein there are twelve playing members, six thereof being distinguishable from the remaining six, whereby the ratio of playing members to board triangles is **12** to **54**.

3,887,191
FOOTBALL BOARD GAME APPARATUS

Charles H. Lucas, Kansas City, Mo., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Oct. 5, 1973, Ser. No. 404,100
Int. Cl. A63f 3/00
U.S. Cl. 273—134 DB 2 Claims



1. A competitive game of simulated football comprising

a plurality of playing cards, each marked as a football field with parallel lines indicating a pair of opposed goal lines and additional parallel lines located at uniform intervals between said goal lines, with each playing card fitted with holes located across the length of the marked football field of a size to individually retain a marker fitted with a dowel pin, with the quantity of such playing cards being sufficient to supply each player with one such card,

a plurality of said markers of a quantity to provide each playing card with one of said markers,

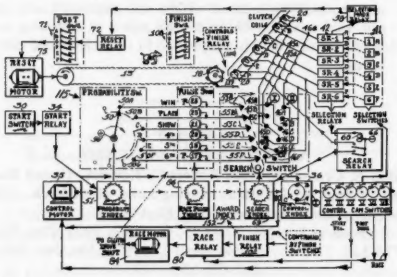
a plurality of play blocks of a quantity to provide a group of play blocks for each of a plurality of players, each play block marked with indicia indicating the results of an individual football play and each bearing indicia identifying the play block with a specific football team.

the holes in the playing card being on said parallel lines, and the play result indicia on each play block including a numeral which is a multiple of said uniform interval and identified by an indicium as either a gain or a loss, representing respectively a playing distance towards or away from a goal line.

3,887,192
RANDOM SELECTIVE SWITCHING APPARATUS

Joseph Edward Lally, McHenry, Ill., assignor to Bally Manufacturing Corporation, Chicago, Ill.

Continuation of Ser. No. 321,579, Jan. 8, 1973, abandoned, which is a division of Ser. No. 110,563, Jan. 28, 1971, Pat. No. 3,709,493. This application Dec. 17, 1973, Ser. No. 425,259
Claims priority, application United Kingdom, Sept. 29, 1970, 46322/70
Int. Cl. A63f 9/00
U.S. Cl. 273—138 A 9 Claims

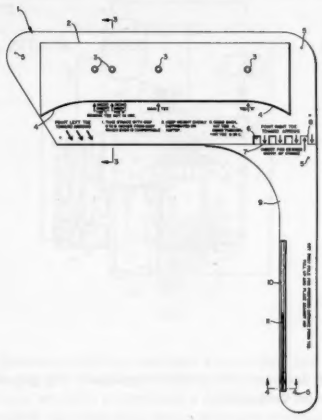


6. Program selection apparatus including a chance operating factor and comprising at least two start-stop type rotary switches one of which is designated a probability switch and has probability contacts engageable by a rotary probability contactor in various stopping positions thereof, and the other of which is designated a search switch and has a rotary search contactor and a plurality of sets of program contacts engageable thereby in various stopping positions thereof; said switches being cooperable in selection duty cycles to effect operational program connections for one or another of said sets of program contacts; a master control circuit including drive means actuated thereby and operative to initiate a said duty cycle and set said contactors in motion; selection switch means operative selectively to establish a search circuit enabling some contact in one or another of said sets of program contacts as a determinant search contact; first circuit means operative responsive to actuation of said selection switch means to effect a stopping of the probability contactor in engagement with some probability contact and enable the search contactor to connect the same with any enabled determinant search contact it encounters; and second circuit means operative responsive to interconnection of an enabled probability contact and an enabled determinant search contact to effect stoppage of the search contactor in program-connecting engagement with the particular set of program contacts containing the determinant search contact which effects such stoppage.

3,887,193
GOLF PRACTICE DEVICE

Carlyle Eugene Stanley, 7075 Idelwood Rd., Falls Church, Va. 22043

Filed Nov. 28, 1973, Ser. No. 419,803
Int. Cl. A63b 69/36
U.S. Cl. 273—186 R 9 Claims

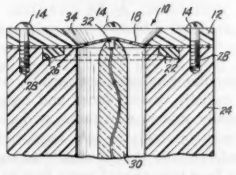


1. A golf practice device for use in perfecting a golf swing comprising in combination: a base having affixed thereto a turf-like mat, wherein said base and said turf-like mat include a plurality of linearly disposed ball supporting means, and wherein said base has a leg extending substantially perpendicularly from one side of said base; having affixed thereto a vertically adjustable indicating member which provides linear and arcuate motion substantially along a longitudinal axis of the perpendicular extension.

3,887,194
MEMBRANE TENSIONING MEANS AND THE USE THEREOF

Joe A. Porter, Whittier, and Allen F. Dageforde, Santa Ana, both of Calif., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Mar. 7, 1974, Ser. No. 449,140
Int. Cl. F16j 9/00, 15/00
U.S. Cl. 277—1 16 Claims

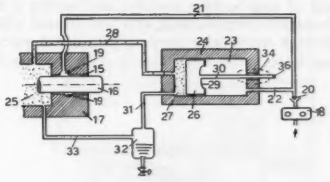


1. The combination of a flexible membrane held in tension against a surface in sealing engagement with respect to said surface, a groove formed in said surface and compressible sealing means loosely positioned in said groove, adjustable clamping means overlying said groove and exerting a compressive force against said membrane and also against said sealing means said groove being of such design as to cause said sealing means upon compression to flow in said groove and then expand outwardly of said groove to engage said membrane and to tension and substantially seal said membrane against said surface.

3,887,195
HIGH PRESSURE SHAFT SEAL DEVICE

Constantino Vinciguerra, Firenze, Italy, assignor to Nuovo Pignone, S.p.A., San Donato Milanese, Italy

Filed Apr. 24, 1973, Ser. No. 353,956
Claims priority, application Italy, Apr. 24, 1972, 23500/72
Int. Cl. F16j 9/00
U.S. Cl. 277—2 3 Claims



1. A device for accumulating and regulating high pressure oil for use in an oil shaft seal of a high working pressure gas blower, comprising:

a high pressure metallic cylinder; a piston slidably positioned within said cylinder and dividing the interior thereof into a first chamber and second chamber; means for maintaining the first chamber in fluid communication with and charged by the gas in the blower; pump means for supplying high pressure oil from a source, conduit means for delivering said high pressure oil to said shaft seal, said conduit means including a, branch line for delivering high pressure oil to said second chamber, and means located upstream of the branch line junction for preventing back flow of oil to said pump means, the cylinder defining a regulating port aligned with and in fluid communication with said second chamber; said piston having a rod extending therefrom through said port, said rod providing a differential pressure area across said piston to cause said second chamber to have a greater pressure than said first chamber, whereby gas is prevented from leaking into the second chamber; said rod further having an outwardly tapered cross-section adjacent its free end, whereby the rod cooperates with the port to vary the flow of oil therethrough in response to movement of said piston, said port being adapted to be closed when said pump means fails to deliver pressurized oil and the oil within said second chamber being delivered to the seal by the movement of the piston under influence of gas pressure in said first chamber.

3,887,196
SELF ALIGNING STUFFING BOX

William Neil Renfrow, 3306 58 St., Lubbock, Tex. 79408

Filed Oct. 9, 1973, Ser. No. 404,768
Int. Cl. F16j 15/00
U.S. Cl. 277—2 5 Claims

1. A self aligning well head structure for use with an oil well tubing and a pumping unit reciprocating a polished rod extending into the well tubing and connected to a string of sucker rods, said self aligning well head structure comprising:

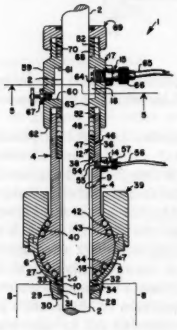
a. a body member having walls defining a cavity adapted to receive a portion of a sphere;

b. a tubular portion extending from said body member and having a side wall and an end wall with a bore therethrough, said tubular portion having a recess coaxial with said bore and communicating with the cavity in said body member, said tubular portion of said body member being adapted to be mounted on an oil well christmas tree;

c. a tubular bushing member having opposite ends and positioned in said tubular portion of said body member and having one end thereof in engagement with the end wall of said tubular portion and a side wall defining a bore adapted to slidingly receive an oil well polished rod dur-

ing reciprocable movement thereof, said tubular bushing member being smaller than said recess for limited lateral movement of said bushing member and oil well polished rod;

d. a rod guide member having a generally spherical end portion received in the cavity in said body member and an elongated tubular portion extending from the spherical end portion and having a side wall defining a bore therethrough, said spherical end portion engaging the other end of said bushing member and having a bore therethrough communicating with and coaxial with the bore through the tubular portion of said rod guide member, said bores through the tubular portion of the body member and through the spherical end portion and tubular portion of the rod guide member being larger than the polished rod providing a clearance greater than the limited lateral movement of said bushing member and polished rod;



e. a retainer mounted on said body member and having walls engaging said spherical end portion of said rod guide member for retaining same in the cavity in said body member; and

f. seal means mounted on said tubular portion of said rod guide member and adapted to slidingly and sealingly engage the oil well polished rod during reciprocable movement thereof.

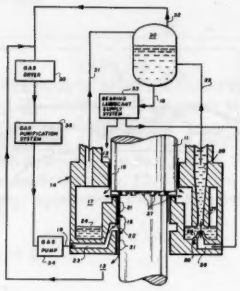
3,887,197

SEAL SYSTEM

Davorin D. Kapich, La Jolla, and Glenn C. Thurston, Del Mar, both of Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Mar. 17, 1972, Ser. No. 235,570
Int. Cl. F16j *15/40*
U.S. Cl. 277—15 **2 Claims**

1. A seal system for a shaft which extends vertically between a first region in which a liquid is present and a second region in which a gas is present, comprising, a seal housing defining an annular land and an annular labyrinth for facing on the shaft, said land being spaced axially along the shaft above said labyrinth, said seal housing further defining an annular fluid collection cavity for communicating with the space between said land and the shaft and the space between said labyrinth and the shaft, said seal housing further defining an annular recess in said labyrinth intermediate the ends thereof, means for introducing the liquid into the space between said land and the shaft, means for introducing the gas into said annular recess, a nozzle for injecting the liquid into said cavity at a level below the level of liquid therein, said nozzle being vertically oriented to inject the liquid vertically upward, and a diffuser communicating with said cavity and aligned to receive fluid from said nozzle for removing liquid and gas entrained therein from said cavity.

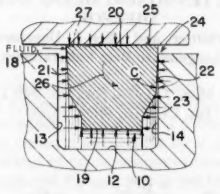


3,887,198

PRESSURE BALANCED RING SEAL

William M. McClure, East Peoria, and Keith K. Klintworth, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 26, 1973, Ser. No. 409,792
Int. Cl. F16j *15/16*
U.S. Cl. 277—27 **14 Claims**

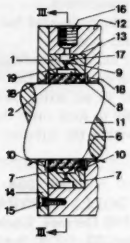


1. A rigid annular ring seal comprising, when viewed in cross section, radially spaced inner and outer faces joined together by axially spaced side faces, at least a substantial portion of at least one of said side faces being completely tapered circumferentially therearound and radially inwardly from said outer face toward said inner face to form an acute angle with respect to said outer face which is slightly less than 90°, said first member being rotatably mounted in a bore formed in a second member, said ring seal freely seated in unsecured relationship in an annular groove formed in said first member to position its outer face closely adjacent to annular surface portions forming said bore to maintain an annular portion of said tapered side face in sealing contact with only an outer portion of a side wall of said groove, located adjacent to said bore, and to fully expose said inner face and said side faces to pressurized fluid, said tapered side face being disposed to diverge radially inwardly with respect to said side wall, toward said inner face.

3,887,199
PRESSURE MEDIUM OPERATED FRICTIONLESS SEAL ASSEMBLY

Yngve Bertil Sundqvist, Partille, Sweden, assignor to SKF Industrial Trading and Development Company B.V., Amsterdam, Netherlands

Filed Dec. 19, 1973, Ser. No. 426,281
Claims priority, application Sweden, Dec. 22, 1972, 16855/72
Int. Cl. F16j *15/24, 15/40*
U.S. Cl. 277—74 **19 Claims**



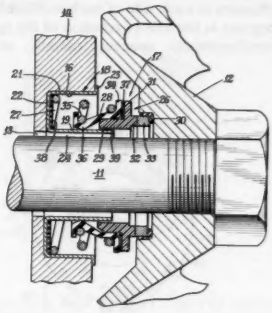
1. A pressure-medium operated frictionless seal assembly for sealing a gap between two members, coaxially rotatable relative one another, comprising a first ring of rigid material and a second ring, said rings being insertible into said gap and mountable each against one of said relatively rotatable members coaxially with the axis of rotation, each one of said rings having at least two annular surface portions, coaxial with the axis of rotation, said portions abutting only respective corresponding surface portions on the other of said rings at least when the sealing device is mounted in the gap, said second ring being elastically deformable at least at the annular surface portion associated therewith, two of said annular surface portions of at least one of said rings being spaced apart by an intermediate annular groove, and a plurality of channels extending through said first ring and opening into said groove for permitting pressure medium to be fed into said groove and building up pressure in said groove such that each annular surface portion on said second ring will be elastically deformed and lifted from the corresponding annular surface portion of said rigid first ring, thereby forming a narrow annular gap between said first and second rings, through which narrow annular gap said pressure medium can leak out to the ambient.

3,887,200
ROTARY SEAL ASSEMBLY

Frederick S. Engelking, and Donald F. Durham, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 27, 1973, Ser. No. 391,861
Int. Cl. R16j *15/34*
U.S. Cl. 277—88 **4 Claims**

1. A rotary seal assembly comprising an annular cupped casing having an inner cylindrical tubular portion,
an outer cylindrical wall portion spaced coaxially outward from said inner tubular portion, and
an annular end wall interconnecting said inner tubular portion and said outer wall portion,
an annular face seal member coaxially disposed about the free end of said inner tubular portion of said casing,
a tubular resilient seal member having one end sealingly engaging said outer cylindrical wall portion and the other end engaging friction means for sealing and coupling said end of said tubular seal member to said annular face seal member,
a compression spring coaxially disposed in the annulus defined between said inner tubular portion and said outer wall portion and resiliently acting axially between said end wall of said casing and the friction means acting on said face seal member, a rotating seal disposed between said face seal member and a hub of a rotatable shaft, and said friction means and said compression spring defining torque accommodating means for accommodating excess

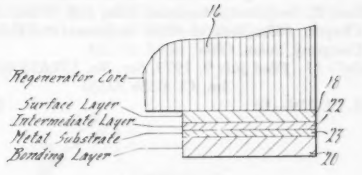


torque exerted by said rotating seal against said face seal member so that said face seal member is permitted to rotate relative to said casing and said tubular seal member to relieve resulting stress on components of said rotary seal assembly.

3,887,201
RUBBING SEAL MATERIAL FOR CERAMIC HEAT EXCHANGER

V. Durga Nageswar Rao, Woodhaven, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 19, 1973, Ser. No. 417,444
Int. Cl. F28d *19/00*
U.S. Cl. 277—96 R **12 Claims**



1. A high temperature rubbing seal for use with a ceramic matrix of a gas turbine regenerator, said seal comprising a metallic substrate, a sealing surface layer and at least one intermediate layer between the surface layer and the substrate, said surface layer having a smooth outer sealing surface adapted to slidably engage the adjacent surface of the regenerator matrix, said surface layer being comprised of approximately 75 to 85 percent copper and cuprous oxide, 9 percent sodium fluoride, 11 percent lithium fluoride and copper nitrate.

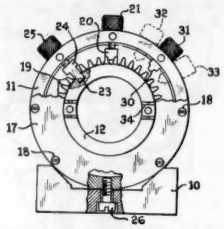
3,887,202
SPEED GRIND FIXTURE

Bruno J. Zapart, P. O. Box 1217, Hot Springs, Ark. 71901

Continuation-in-part of Ser. No. 306,178, Nov. 13, 1972, abandoned. This application Sept. 10, 1974, Ser. No. 504,482
Int. Cl. B23q *17/04;* **B23b** *31/36;* **B24b** *41/06*
U.S. Cl. 279—5 **10 Claims**

1. A workpiece holder comprising an outer cylindrical housing, a hollow open-ended generally cylindrical spindle extending concentrically within said housing and projecting forwardly therefrom, a forward annular closure rigidly secured to said housing, a rearward annular closure including a

rearwardly extending concentrically disposed manipulating ring attached to said spindle, bearing means within said housing rotatably supporting said spindle, a row of 36 equally spaced radially directed and outwardly tapered spindle teeth extending concentrically around the spindle, the circumferential spacing between the inmost points between each pair of the interspaces at each side of each tooth subtending an angle of ten degrees at the axis of rotation of the spindle, a plurality of circumferentially spaced, radially movable spindle-



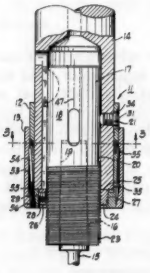
engaging indexers mounted along the exterior of said housing, said indexers projecting radially inward through the wall of the housing to removable engagement with selected pairs of adjacent teeth along the adjoining tapered surfaces of the teeth for precluding rotary movement of the spindle, said indexers including at least a first and a second indexer spaced respectively for movement along radial planes subtending an angle in degrees at the axis of the spindle which is the product of the number ten and a mixed number, and clamping means effective to removably secure a workpiece to the revoluble spindle.

3,887,203

QUICK CHANGE CHUCK

Milton L. Benjamin, Moreland Hills, and Wilbur N. Miles, Chagrin Falls, both of Ohio, assignors to Erickson Tool Company, Solon, Ohio

Filed July 9, 1973, Ser. No. 377,635
Int. Cl. B23b *31/20*
U.S. Cl. 279—50 **12 Claims**



11. A quick-change chuck to hold a tool with a nut thereon in the open front end of a tubular spindle,

said nut adapted to abut the open end of the spindle and to have a threaded adjustment on the tool for shifting the tool in an axial direction relative to the spindle,

said nut having a shoulder at the junction of the outer face with a generally cylindrical outer surface of the nut,

said chuck comprising, in combination,

a locking sleeve adapted to surround the tubular spindle, means to secure said locking sleeve to the spindle,

a movable control sleeve surrounding said locking sleeve,

a plurality of chuck fingers resiliently supported in said locking sleeve and extending toward the front end of said locking sleeve,

a tapered foot on the front end of each of said fingers engageable with the shoulder of the nut,

a shoulder on the inner surface of the front of said control sleeve engaging with the heels of said feet,

a taper on one of said control sleeve shoulder and said heels of said feet to establish a first angle of engagement relative to said axis,

the angle of taper of said feet being at least three times said first angle of engagement,

a plurality of apertures in said locking sleeve substantially parallel with said axis,

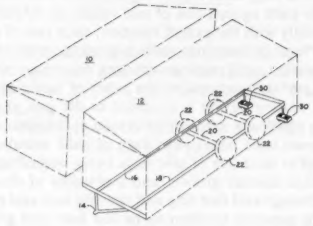
and spring means including individual springs in said apertures acting between said sleeves to urge said control sleeve shoulder in an axial direction to urge said feet radially inwardly to lock onto the adjusting nut and lock a tool axially within the tubular spindle.

3,887,204

DOLLY APPARATUS

Leslie Rex Austin, 598 Hermes, Encinitas, Calif. 92024

Filed Mar. 22, 1974, Ser. No. 453,867
Int. Cl. B60k *25/00*
U.S. Cl. 280—3 **7 Claims**



1. Dolly means for lifting a mobile home and shifting said home laterally comprising a frame, roller means supporting said frame and journaled therein for shifting said home, and lifting means supported by said frame and upwardly directed to engage the undersurface of said home on its underframework, said roller means including at least a pair of rollers with their axes of rotation parallel and spaced apart, said lifting means comprising jack means located on a vertical axis extending between said axes of a rotation, said frame having first and second invertible faces, said jack means having support means on said frame operative to support said jack means in either of the invertible positions of said frame, and said roller means having bearings closer to said first face of said frame than to said second face so that said jack means will be lower in one position of said frame than the other so as to engage this underframeworks of mobile homes which are closer to the ground than others.

3,887,205

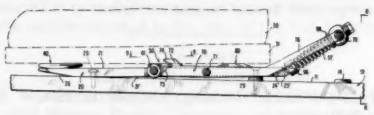
SAFETY SKI BINDING

James Mitchell Edmund, 5262 Olde Stage Rd., Boulder, Colo. 80302

Filed Sept. 18, 1973, Ser. No. 398,447
Int. Cl. A63z *9/08*
U.S. Cl. 280—11.35 K **36 Claims**

1. A safety ski binding which includes a ski plate adapted to be fastened onto the ski, a boot plate means adapted to be fastened to the bottom side of the sole of the ski boot interme-

diate its heel and toe portion, supporting means secured to the sides of the ski plate for cooperation with the boot plate means and lever means pivotally secured to the side of the ski plate rearwardly of the support means and having forwardly extending boot plate engaging portions to hold by spring-action the boot plate means onto the surface of the support means in the engaged position of the ski binding while enabling the boot plate means to ride over the support means in case of a forward fall with predetermined force, and spring means for resiliently urging the lever means in the engaging position with a predetermined force when the binding is engaged,



wherein anti-friction means are arranged between the front portion of the ski plate and the boot sole, said anti-friction means comprising:

a first washer means,

a second washer means with low-friction surfaces,

a disk means with low-friction surfaces,

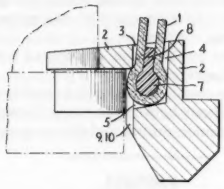
and holding means for holding said first washer means and second washer means fixedly with respect to the ski plate with one side of said second washer means being supported at said first washer means and the other side of said second washer means supporting said disk means.

3,887,206

SECURITY BINDINGS FOR SKIS

Georges Pierre Joseph Salomon, Annecy, France, assignor to S.A. Francois Salomon & Fils, France

Division of Ser. No. 95,143, Dec. 4, 1970, Pat. No. 3,778,072.
This application Oct. 5, 1973, Ser. No. 404,373
Claims priority, application France, Dec. 5, 1969, 69.42070
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35 N **2 Claims**



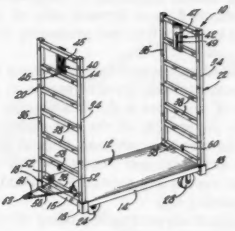
1. A device for connecting a ski to a skier comprising: a body portion connectable to a ski during use of the device and having means therein defining a bore having a stepped configuration with a smaller cross-sectional portion and a larger cross-sectional portion, and a slot which opens at one end into said bore and at the other end at the surface of said body portion; a lashing connectable to a skier during use of the device and having a folded portion defining a loop received within said bore and extending outwardly therefrom through said slot; and an elongated locking member inserted into the interior of said loop continuously wedging said loop against the bore surface to effect locking of said lashing to said body portion irrespective of whether said lashing is in a tensioned or slackened condition, said locking member comprising a pin having a shank portion extending through the interior of said loop and into said smaller cross-sectional portion, and a head portion force fitted into said larger cross-sectional portion to thereby maintain said lashing locked to said body portion.

3,887,207

CART

John M. Gotsch, Jr., Westfield, N.J., assignor to Gauer Metal Products, Inc., Kenilworth, N.J.

Filed Mar. 1, 1973, Ser. No. 337,099
Int. Cl. B62d *39/00*
U.S. Cl. 280—33.99 T **9 Claims**



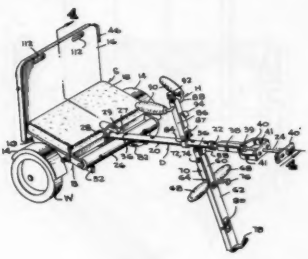
1. A cart comprising a deck member, a pair of end members detachably mounted upright at opposite ends of said deck member, at least one end member from another cart of similar design being supportable by the deck member contiguous to one of the end members, and retaining means integral with each of the end members for releasably interlocking the at least one end member with said one of the end members when contiguous thereto, and wherein said retaining means of each end member comprises a projecting member extending from one side of the end member for releasably engaging an adjacent end member when the end member is moved so that its projecting member is moved into a predetermined relation with the adjacent end member and then lowered relative thereto.

3,887,208

COLLAPSIBLE AND PORTABLE UTILITY CART

Paul Vidal, 8409 14th Ave., Langley Park, Md. 20783

Filed Jan. 18, 1974, Ser. No. 434,688
Int. Cl. B62b *1/10*
U.S. Cl. 280—36 C **19 Claims**



1. A collapsible, portable, hand-and-vehicle-pullable utility cart and child's stroller comprising in combination:

a. cart body means including a generally planar first supporting member disposable selectively at both generally parallel and transverse attitudes relative to a supporting surface on which the cart is used, said body means also having at least two axially aligned supporting wheels rotatably connected thereto;

b. said cart body means including a second generally planar supporting member pivotally connected adjacent a rearwardmost side of said first-mentioned generally planar supporting member and disposed to be foldable toward and away therefrom; said first-mentioned planar supporting member constituting a seat portion for a child to ride

upon; said second planar member constituting both a seat back and a transverse rearwardmost support for any items carried in association with said first-mentioned supporting member; and said seat and seat back members having complementary abutment portions and link means for maintaining predetermined selective relative adjusted positions between fully open and folded close positions;

c. drawbar means including a longitudinally extended drawbar attached to a forward side of said cart body means and having a free end projecting forwardly therefrom;

d. an articulated cart-supporting leg having one end pivotally connected to said drawbar means at a point spaced forwardly of said cart body means, with the other end operatively engageable on the cart-supporting surface to maintain the cart in a stabilized, normal utility use condition when at rest on said wheels and not being pulled;

e. child's foot-supporting members attached to said articulated supporting leg;

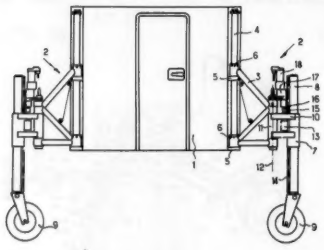
f. said articulated supporting leg being of composite form including second pivotal means interconnecting first and second composite-forming leg portions so as to facilitate selective relative folding movement of said leg portions; cooperative means on mid-leg portions to releasably lock them in rigid coextensive aligned conditions; and

g. said pivotally connected supporting leg disposed so as to be adjusted between a forwardmost extended cart-stabilizing position and a rearwardly folded or retracted cart-pulling position, attendant movement of said cart supporting leg about said pivotal connection with said drawbar means.

3,887,209
LOAD-HANDLING APPLIANCE

Henri Blanc, 21 Boulevard de Beausejour, Paris 16eme, France

Filed Jan. 9, 1974, Ser. No. 431,969
Claims priority, application France, Jan. 10, 1973, 73.00753
Int. Cl. B62d *61/12*
U.S. Cl. 280—43.21 **3 Claims**



1. Load-handling appliance comprising a plurality of mobile assemblies adapted to be secured to the load, each assembly including:

a bracket;

a vertical axle fast with the load about which the bracket can swivel and along which the bracket can slide;

means for securing said bracket to said axle against said sliding movement;

a worm gear;

a sleeve paralled with said vertical axle, attached to and adapted to pivot relative to said bracket and to support the worm gear;

a rack bar for engagement with the worm gear;

a support member slidably mounted in said sleeve and being fast with the rack bar,

an electric motor speed-reducer assembly having an output shaft to which the worm gear is coupled;

an eccentric collar secured to said motor speed-reducer assembly,

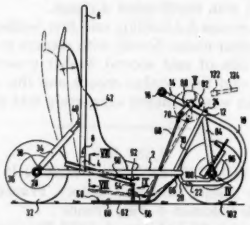
pivot means mounted on said bracket and supporting said eccentric collar for pivotal movement about an axis which is coaxial with the pivotal axis of the sleeve relative to the brackets, and

a coupling sleeve connecting said worm and said output shaft, said pivot means including an extension upon which said eccentric collar is slidably mounted, said extension including means for locking the collar in an upper and lower position thereof on said extension.

3,887,210
DOWNHILL RACING CART

Peter Funke, Munich, Germany, assignor to ISPOW AG, Chur, Switzerland

Filed Jan. 4, 1974, Ser. No. 430,757
Claims priority, application Germany, Oct. 16, 1973, 2351938; Jan. 9, 1973, 2300822
Int. Cl. B62b *11/00;* **F16d** *63/00*
U.S. Cl. 280—87.01 **8 Claims**



1. A cart comprising:

a. a frame having a median plane upright in the normal operating condition of the cart;

b. a plurality of wheels rotatably mounted on said frame for engagement with a surface on which the cart travels;

c. a driver's seat mounted on said frame for tilting movement about an axis transverse to said plane, said seat facing in a forward direction;

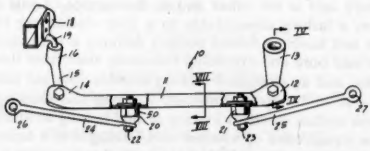
d. a hook mounted on said frame and spaced from said seat in a forward direction; and

e. coupling means coupling said hook to said seat for pivotally moving the hook between an inoperative position and an operative position during said tilting movement.

3,887,211
STEERING LINKAGE

Sylvester S. Mazur, Detroit, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed Aug. 17, 1970, Ser. No. 64,404
Int. Cl. B62d *7/16*
U.S. Cl. 280—95 R **10 Claims**



1. In a vehicle steering linkage, the improvement of a stamped centerlink member, said centerlink member substantially U-shaped in cross section having punched openings adjacent either end thereof in the side legs of the U for attach-

ment of pitman arm and idler arm assemblies and stamped openings through the bight thereof intermediate the ends for attachment of tie rod sockets.

5. In a steering linkage for attachment to dirigible wheels of a vehicle incorporating tie rods each attached at one end to a centerlink and at the opposite end to a dirigible wheel, the improvements of one piece tie rods attached to said centerlink, said centerlink having axially elongated slots, said tie rods having adjusting means axially shiftable in said slots, and locking means on said adjusting means securing said adjusting means in selected fixed positions in said slots, whereby the points of attachment of said tie rods to the said centerlink may be moved to provide for toe adjustment of the dirigible wheels of the vehicle attached to the ends of the said tie rods.

3,887,212

SAFETY BELT FOR MOTOR VEHICLES

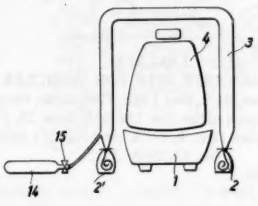
Per-Olaf Weman, Haslah, Germany, assignor to Sigmatex AG Basel, Basel, Switzerland

Filed Dec. 20, 1972, Ser. No. 316,953

Claims priority, application Germany, Dec. 24, 1971, 2164544

Int. Cl. B60r *21/10*

U.S. Cl. 280—150 SB **6 Claims**



1. Safety belt apparatus for a motor vehicle comprising: a hip belt adapted to be fastened across the hips of an occupant in the vehicle, said hip belt having two ends, said hip belt secured at the two ends to the vehicle; at least one belt roller attached to an end of said hip belt, and at least one traction means which unrolls the hip belt from the belt roller when the car door is opened and releases the belt so that it can be rolled up by the belt roller to bear tightly on the body of the occupant when he is seated in a seat of the vehicle; and wherein said traction means is a gas cartridge, said hip belt is tubular and is connected to said gas cartridge supplying gas to inflate said hip belt overcome the pull of said belt roller upon opening of the vehicle door adjacent said seat.

3,887,213

INFLATABLE VEHICLE OCCUPANT RESTRAINT AND SYSTEM THEREFOR

George W. Goetz, Detroit, Mich., assignor to Eaton Corp., Cleveland, Ohio

Filed Feb. 28, 1973, Ser. No. 336,862

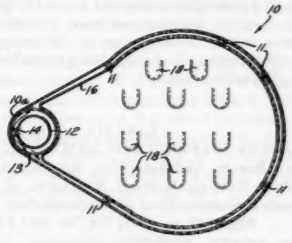
Int. Cl. B60r *21/08*

U.S. Cl. 280—150 AB **11 Claims**

1. An inflatable vehicle occupant restraint system comprising:

a. a fluid source means operative to emit fluid under pressure;

b. an inflatable confinement having a collapsed inoperative condition and an expanded operative condition, wherein said confinement has, (i) an inflatable framework disposed adjacent the wall of said confinement and communicating with said fluid source means such that, upon inflation of said framework, said confinement is expanded to the operative condition, (ii) one-way valve means disposed in the wall of said confinement and operable to open upon inflation of said framework, and expansion of said confinement to permit atmospheric air to flow into the interior of said confinement, said valve means including at least one patch having an excess of material and having the entire periphery thereof attached to the wall of said confinement, said patch being expandable upon expansion of said confinement to define in cooperation with the confinement wall a secondary chamber and to



open said valve means, said patch having at least one outlet aperture formed therein with the wall of said confinement having at least one inlet aperture formed therein, said wall aperture being staggered from said patch aperture, said patch being collapsible against the confinement wall to prevent air flow through said staggered apertures to close said valve means upon contact of the confinement by the vehicle occupant.

3,887,214

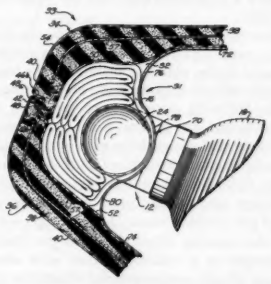
INFLATABLE VEHICLE OCCUPANT RESTRAINT SYSTEM AND MEANS FOR SUPPORTING SAME

Darrell S. Brawn, Livonia, Mich., assignor to Eaton Corp., Cleveland, Ohio

Division of Ser. No. 164,721, July 21, 1971, Pat. No. 3,756,617, which is a division of Ser. No. 857,666, Sept. 15, 1969, Pat. No. 3,640,546. This application Aug. 29, 1973, Ser. No. 392,705

Int. Cl. B60r *21/08*

U.S. Cl. 280—150 AB **3 Claims**



1. An inflatable vehicle occupant restraint system comprising:

a. an inflatable confinement expandable from a collapsed nonoperative configuration to an expanded operative configuration for restraining a vehicle occupant;

b. fluid supply means operable in response to a vehicle collision to release pressurized fluid for inflating said confinement;

c. means for directing said released fluid into said confinement, said directing means including diffuser means, said confinement in the collapsed configuration being disposed about said diffuser means;

d. means for supporting said fluid supply and said diffuser means on the vehicle, said supporting means having portions thereof arcuately shaped and formed in contracurvature, said portions being deformable to absorb at least part of the energy of the vehicle occupant upon impact of the occupant with said diffuser means; and

e. a plurality of separate closure sections disposed over said collapsed confinement with each of said closure sections having a protective casing and a core of resilient deformable material, said sections being operable to absorb at least a portion of the energy of said occupant upon impact therewith, said sections being operable on expansion of said confinement.

3,887,215

SAFETY STEERING FOR MOTOR VEHICLES

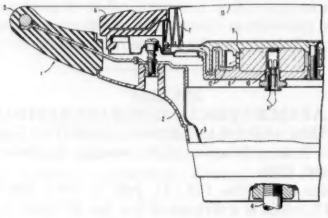
Wilhelm Albrecht, Vaihingen/Enz; Helmut Patzelt, Fellbach, and Peter-Matthias Hoheisel, Esslingen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Oct. 4, 1973, Ser. No. 403,531

Claims priority, application Germany, Oct. 5, 1972, 2248925

Int. Cl. B60r *21/10*

U.S. Cl. 280—150 AB **10 Claims**



1. A safety steering device for a vehicle comprising

plastically deformable deformation means arranged between a steering wheel and the upper end of a steering spindle,

padded plate means arranged inside the steering wheel rim, said padded plate means having a surface lying approximately in the plane of the steering wheel rim, and

a structural unit including gas cushion means for automatically inflating upon a predetermined condition of the vehicle and gas generator means for producing inflating gas into said gas cushion means upon said predetermined condition, said structural unit being arranged between said deformation means and said padded plate means wherein said padded plate means surrounds a portion of said gas cushion means lying approximately in the plane of the steering wheel rim, said gas cushion means being arranged in a folded-together state prior to the occurrence of said predetermined condition and surrounded at a central area of the padded plate means, the folded-together gas cushion means simultaneously forming padding within the central area.

3,887,216

VEHICLE STEP ASSEMBLY

Gary D. Perry, Lubbock, Tex., assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

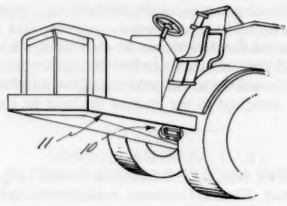
Filed Aug. 5, 1974, Ser. No. 495,123

Int. Cl. B60r *3/02*

U.S. Cl. 280—163 **5 Claims**

1. A step assembly for use with a vehicle to be operated in rough terrain, said step assembly comprising

a. a loop of flexible material, said loop having sufficient strength to support the weight of a man, and sufficient width and strength to resist the horizontal displacement of said step assembly when assembled and subjected to the horizontal component of the force of a man stepping on said step assembly,



b. a step plate attached to the inside portion of the bottom of said loop,

c. a clamping plate attached to the inside portion of the top of said loop, and

d. means for clamping said clamping plate to a generally downwardly facing mounting surface on the vehicle frame.

3,887,217

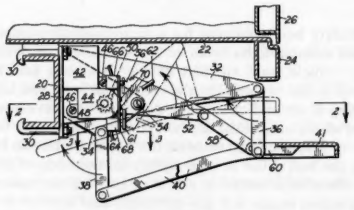
RETRACTABLE STEP FOR VEHICLES

Walter W. Thomas, Rt. 1, Box 130B, Clatskanie, Oreg. 97016

Continuation-in-part of Ser. No. 196,836, June 23, 1972. This application Dec. 3, 1973, Ser. No. 421,082

Int. Cl. B60r *3/02*

U.S. Cl. 280—166 **1 Claim**



1. A retractable step for high clearance vehicles of the type having a longitudinally extending frame member, comprising

a. a vertical base plate,

b. releasable clamp means on said base plate arranged to secure said base plate vertically against the side of the frame member of the vehicle,

c. a pair of support arms extending integrally from said base plate at right angles thereto whereby to be disposed laterally of the vehicle,

d. a third support arm extending integrally from said base plate at right angles thereto and between said pair of support arms,

e. a step plate,

f. a pair of side frames extending integrally from said step plate toward said base plate,

g. said side frames extending angularly inwardly toward each other from said step plate,

h. a pair of depending links pivotally connected between respective ones of said support arms and said side frames,

i. a third depending link pivotally connected between said third support arm and an inward end of said side frames,

j. said pair of depending links and said third depending link being arranged upon pivoted movement in one direction to raise and retract said side frames and upon pivoted

movement in the other direction to lower and extend said side frames,

k. a lever arm pivotally mounted intermediate its ends on said third support arm in parallel relation to the latter,

l. a gear segment on one end of said arm,

m. pivot link means connecting the other end of said lever arm to said step plate,

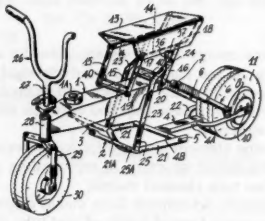
n. and reversible electric motor means mounted on said base plate having an output shaft with a pinion gear thereon in meshing engagement with said lever arm gear segment for rotating the latter to move said side frames between their raised and lowered positions.

3,887,218

COLLAPSIBLE VEHICLE

Rosario Di Blasi, Via Messina 6, Francofonte, Italy

Filed Feb. 4, 1974, Ser. No. 439,031
Claims priority, application Italy, Feb. 28, 1973, 20983/73
Int. Cl. B60k *15/00*
U.S. Cl. 280—278 **8 Claims**



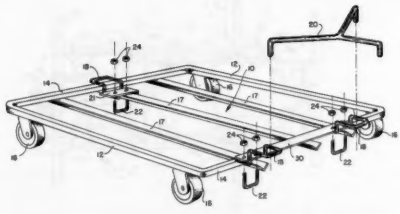
1. A collapsible vehicle, preferably two-wheeled and powered vehicle including a saddle, comprising a frame formed of at least one articulated quadrilateral connected by at least one control rod to at least one lever joining said saddle to one side of said articulated quadrilateral, whereby the rotation of the saddle and lever as well will cause through said lever the deformation of said articulated quadrilateral.

3,887,219

DETACHABLE COUPLER ADAPTER FOR ROLLING BASE DOLLIES

James D. Wilson, Newport Beach, Calif., assignor to Banner Metals Division Intercole Automation, Inc., Compton, Calif.

Filed May 20, 1974, Ser. No. 471,218
Int. Cl. B60d *1/14*
U.S. Cl. 280—408 **1 Claim**



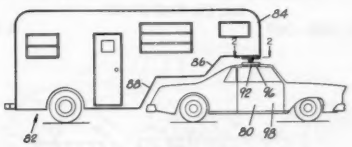
1. A detachable coupler adapter for intercoupling wheeled carriages such as rolling base dollies, and the like, each of the carriages having a peripheral rod-like member forming a rectangular base with two end edges and two side edges and a plurality of elongated bottom support members extending in spaced and parallel relationship from one of the end edges to the other across the area circumscribed by said rod-like member, said adapter including a first loop member mounted at one of the end edges of the base, second and third loop members mounted at spaced positions at the other end edge of the base, bracket means for mounting the individual loop members on the base, said bracket means including a first transverse strip attached to said first loop member and a first U-shaped bolt extending around one of said bottom support members and through holes in the first transverse strip to mount the first loop member on the base, and said bracket means including a second transverse strip attached to said second and third loop members, and second and third U-shaped bolts respectively extending around two of said bottom support members and through holes in said second transverse strip to mount the second and third loop members on the base, and a three-pronged bar member having a hooked configuration at the end of each prong, so that two of the prongs of the bar member detachably engage the second and third loop members of one of the wheeled carriages, and so that the third prong of the bar member detachably engages the first loop member of another of the wheeled carriages.

3,887,220

HITCH FOR TRAILERS OVERHANGING A CAR BODY

Percy P. Hall, 4103 W. Main St. Apt. 21, Kalamazoo, Mich. 49007

Division of Ser. No. 306,042, Nov. 13, 1972. This application Oct. 5, 1973, Ser. No. 403,774
Int. Cl. B62d *53/00*
U.S. Cl. 280—423 R **5 Claims**



1. A hitch between trailers and towing vehicles in which the trailer has a forward end elevated above and adapted to be connected to an upper part of the vehicle, said hitch comprising:

A. a pair of upwardly opening yoke members,

B. means connecting said yoke members in transversely aligned relation adjacent opposite sides and over the top of the body of said vehicle,

C. an upper bearing plate having a transverse width of the order of one foot attachable in fixed lapped relation to an exposed under surface of the front end of said trailer,

D. a lower bearing plate approximately coextensive with said upper bearing plate and permanently connected in coasting relation thereto by a central vertical pivot,

E. a transverse support bar rigidly connected to said lower bearing plate and projecting beyond the sides thereof,

F. and rocker pins carried by the ends of said support bar and projecting therefrom in position to be removably received in said yoke members.

3,887,221

JOINT COUPLING

Niels O. Young, Mason, N.H., assignor to Block Engineering, Inc., Cambridge, Mass.

Filed June 15, 1973, Ser. No. 370,355
Int. Cl. F16l *17/00*
U.S. Cl. 285—236 **18 Claims**

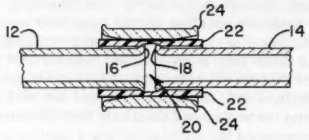
1. A coupling, comprising in combination:

a pair of elongate tubes;

a connecting sleeve; and

a relatively substantially rigid locking sleeve comprising a one piece, relatively short cylinder having an inside taper: one of said pair of elongate tubes or said connecting sleeve being relatively substantially rigid and the other being relatively distortable, said pair and said connecting

sleeve being dimensioned so as to be engageable with each other at a junction,



said locking sleeve surrounding said relatively distortable one at said junction and being dimensioned so that its inside taper distorts said relatively distortable one and squeezes said pair and said connecting sleeve together adjacent said junction.

3,887,222

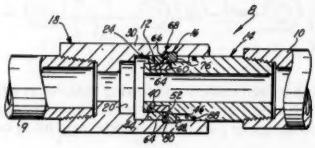
COUPLING WITH PUSH-PULL RELEASE

Harry H. Hammond, Middleburg, Ohio, assignor to The Hansen Manufacturing Company, Cleveland, Ohio

Filed July 25, 1974, Ser. No. 491,790

Int. Cl. F16l *37/00*

U.S. Cl. 285—307 **6 Claims**



1. A coupling assembly for connecting a plurality of conduits in fluid communication, said coupling assembly comprising a socket connected with one of the conduits, said socket including socket wall means for at least partially defining a socket chamber and stop surface means for defining a stop surface disposed in said socket chamber and for at least partially defining an opening of a predetermined size, a plug connected with the other of the conduits and adapted to be received in said socket chamber, a resilient lock ring disposed on said plug, said lock ring having a generally circular retaining surface adapted to engage said stop surface when said plug is disposed in a first position in said socket chamber to thereby hold said plug in said socket chamber, said lock ring being deflectable between a first condition in which said retaining surface on said lock ring has an outside dimension which is greater than the size of the opening formed by said stop surface and a second condition in which said retaining surface on said lock ring has an outside dimension which is less than the size of the opening formed by said stop surface to enable said lock ring to pass through the opening formed by said stop surface, and cam means disposed in said socket chamber inwardly of said stop surface for resiliently compressing said lock ring from said first condition to said second condition upon movement of said plug element axially inwardly from said first position to a second position and for retaining said lock ring in said second condition during axially outward movement of said plug as at least a portion of said lock ring passes through the opening formed by said stop surface.

3,887,223

COLLISION ENERGY DISSIPATION APPARATUS FOR A PASSENGER MOTOR VEHICLE

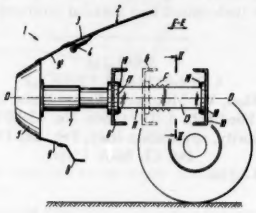
Ulrich Bez, Gerlingen, Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Germany

Filed Dec. 20, 1973, Ser. No. 426,543

Claims priority, application Germany, Dec. 20, 1972, 2262293

Int. Cl. B60r *19/04*

U.S. Cl. 293—70 **28 Claims**



1. Collision energy dissipation apparatus for a vehicle of the type having an end part and a relatively rigid vehicle frame structure spaced from the end part; said apparatus comprising:

first tube element means disposed between the end part and the frame structure,

second tube element means disposed between the end part and the frame structure in surrounding relationship to said first tube element means,

and plastically deformable foam means disposed inside of a hollow space formed inside of said tube element means, wherein said foam means and said first and second tube element means are configured for dissipating collision energy forces acting on said end part in a direction toward said frame structure by plastic deformation of said foam means and by plastic deformation of said tube element means while at least portions of said first and second tube element means move relative to one another.

3,887,224

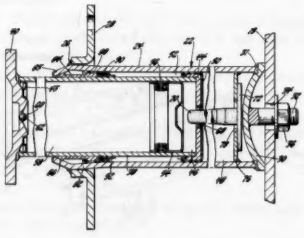
IMPACT ENERGY ABSORBER WITH RADIALLY ADJUSTABLE FLOW METERING

Frank H. Browne, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 1, 1974, Ser. No. 456,560

Int. Cl. B60r *19/06;* **F16f** *9/342*

U.S. Cl. 293—85 **4 Claims**



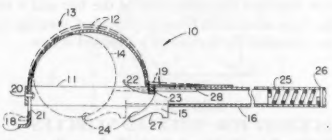
1. An impact energy absorber unit for mounting a bumper assembly to a vehicle body structure comprising first and second cylinders providing first and second fluid chambers therein, support means mounting said first cylinder for telescoping movement with respect to said second cylinder between an extended position and a retracted position, said first cylinder having a cap secured to one end thereof, said cap

dividing said cylinders into first and second hydraulic chambers, each of said chambers having oil therein, said cap having a fixed centralized orifice formed therein providing hydraulic communication between said chambers, an elongated metering rod projecting into said orifice and extending longitudinally in said unit, an annular support disc secured to the interior cylindrical wall of said second cylinder adjacent to one end thereof, said support disc having an enlarged central opening therethrough, said metering rod extending through said central opening, said metering rod having an enlarged base member integral therewith which directly covers said central opening, said central opening providing clearance for said metering rod to allow said metering rod to adjust radially with respect to said orifice to meter a predetermined flow of oil from said first chamber to said second chamber in response to the telescoping movement of said first cylinder into said second cylinder.

3,887,225
GOLF BALL RETRIEVER

Roy L. McKee, 1506 Wagon Wheel, Garland, Tex. 75040

No Drawing. Filed June 24, 1974, Ser. No. 482,243
Int. Cl. A63b *57/00*
U.S. Cl. 294—19 A **10 Claims**

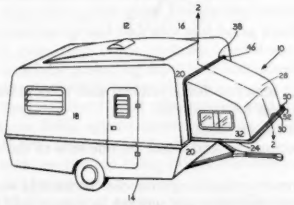


1. In a ball retriever; a semi-enclosed ball cage including a fixed-position generally circumferential rib member, and a rib member having a resiliently deflectable extension with a plunger shoulder locking projection; a ball retaining plunger with a plunger position locking shoulder; hollow shaft means attached to said cage members and to an extension handle; and resilient plunger driving means positioned in said hollow shaft means.

3,887,226
TRAILER PULL-OUT UNIT

Ralph Stewart Hart, 1521 Lorne Park Rd., Mississauga, Ontario, Canada

Filed Mar. 2, 1973, Ser. No. 337,583
Int. Cl. B60p *3/32*
U.S. Cl. 296—26 **2 Claims**

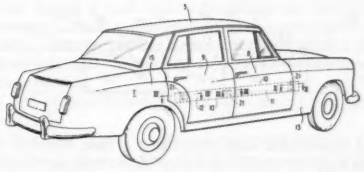


1. A mobile structure having a wall provided with a rectangular opening defining a plurality of edges having at least one horizontal edge thereto; an extension to said structure comprising a floor panel extensible outwardly of said horizontal edge of said opening; a cover panel extensible outwardly of said opening from an edge thereon opposite said horizontal edge from which said floor panel extends; side panels connecting said floor and cover panels together to provide rigidity to said extension; said floor panel being pivotable on said horizontal edge of said opening allowing said extensionn to be rotatably moveable from a closed position within said structure to an open position externally of said structure; a seal secured to an edge of said opening opposite to said edge on which said floor panel is pivoted and including internally and externally projecting portions thereto; a flange projecting outwardly of the edge of said cover remaining within said structure, said flange bearing against said internally projecting portion of said seal when said extension is positioned externally of the said structure, said floor panel at its outer edge opposite that on which it is pivoted having a flanged plate projecting outwardly therefrom and generally parallel therewith; said externally projecting portion of said seal being receivable into and contained by said flanged plate when said extension is in said closed position within said structure.

3,887,227
INSTALLATION FOR THE PROTECTION OF MOTOR VEHICLE BODIES AGAINST LATERAL IMPACTS

Franz Deckert, Sindlefingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Continuation of Ser. No. 872,823, Oct. 31, 1969, abandoned. This application Oct. 14, 1971, Ser. No. 189,093
Claims priority, application Germany, Nov. 2, 1968, 1806716
Int. Cl. B60r *21/02*
U.S. Cl. 296—28 R **48 Claims**



1. An installation for the protection of motor vehicle bodies against lateral impacts, characterized in that a wall means of the body disposed within the passenger space is reinforced by at least one tension means extending in the longitudinal direction, said tension means being securely connected in front and in the rear thereof with reinforced parts of the front and rear portion of the vehicle, said tension means being at least one tension member for converting substantially all lateral impact forces against said at least one tension member into tensional forces to be absorbed by said reinforced parts.

3,887,228
FOLDABLE WHEELCHAIR AND KIT THEREFOR

Philip E. Ingerson, 4825 96th St., Oak Lawn, Ill. 60453

Filed Nov. 28, 1973, Ser. No. 419,607
Int. Cl.[2] A47C *4/28*
U.S. Cl. 297—39 **9 Claims**

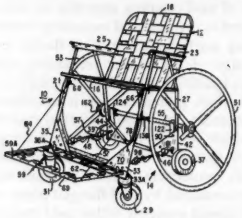
6. A kit adapted to be attached to a foldable chair of the type having a lightweight frame with interwoven flexible webs secured thereto to form a seat, a back, and a U-shaped front leg structure and a U-shaped rear leg structure and foldable between a use position and a storage position, comprises:

a rear pair of generally flattened, hollow cup-shaped corner brackets adapted to fit over and to receive the corners of the rear U-shaped leg structures and adapted to be secured in place thereon;

a pair of wheels connected to the rear pair of brackets for partially and rollably supporting the chair over the supporting surface;

a front pair of generally flattened, hollow cup-shaped corner brackets adapted to fit over and to receive the corners of the front U-shaped leg structure and adapted to be

secured in place thereon; a pair of casters connected to the front pair of brackets for partially and rollably supporting the chair over a supporting surface; and at least



one elongated strut element connected between one of said rear pair of brackets and one of said front pair of brackets.

3,887,229

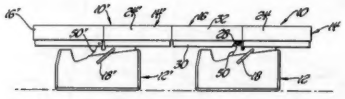
CONVERTIBLE SEAT

Robert W. Plume, Sterling Heights, Mich., assignor to Travel Products, Inc., Washington, Mich.

Filed Feb. 11, 1974, Ser. No. 441,080

Int. Cl. B60n *1/10*; A47c *13/00*

U.S. Cl. 297—65 **14 Claims**



1. A convertible seat comprising a base member, a seat bottom support member mounted on the base member, a seat bottom cushion holder mounted on the seat bottom support member and adapted to receive a seat cushion, a seat back support member, a seat back cushion holder mounted on the seat back support member and adapted to receive a seat back cushion, said seat back support member being mounted on the seat base member for pivotal motion in the fore and aft direction relative to the seat bottom support member by a pivot element disposed below the level of the upper surface of the seat bottom cushion, one of said cushion holders being movably mounted on the respective said support member for movement toward and away from said pivot element, said seat back support member being disposed in an erect position to make a seat and being pivotally movable in the aft direction to a prone position to make a bed, and means connected with said one of the said holders for moving it relative to its support member toward the pivot element when the seat back support member is pivoted downwardly to convert the seat to a bed whereby said cushions on said holders may be positioned edge to edge without a gap therebetween in the bed.

3,887,230

FASTENING MEANS FOR PASSENGER SEATS

Uwe Gröning, Hamburg, and Uwe Lüthgens, Buxtehude, both of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed June 24, 1974, Ser. No. 482,073

Claims priority, application Germany, June 29, 1973, 2333037

Int. Cl. A47c *4/02*

U.S. Cl. 297—232 **5 Claims**

1. A securement arrangement for passenger seats for use on aircraft and various types of vehicles, same having a bar on their undersides, on which bar there are arranged movably and securably base structures which support the seats, comprising the improvement wherein the base structures have a locking pin which engages a bore of the bar by means of spring

force and that between the underside of the bar and a sliding surface of the base structures there is provided a wedge spring which can be clamped by means of a knurled screw.

3,887,231

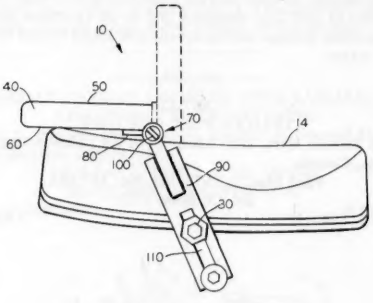
BACKREST FOR WHEELED VEHICLES

Frank J. Bochynsky, Highland Park, N.J., assignor to The Byke Co., Highland Park, N.J.

Filed Jan. 28, 1974, Ser. No. 437,177

Int. Cl. A47c *3/00*

U.S. Cl. 297—366 **4 Claims**



1. A bracket structure for a vehicle, said vehicle including a frame and a seat for the driver.

said structure comprising

a bracket secured to said frame on one side of the driver's seat,

a ratchet wrench comprising a handle, a rotatable shaft, and a switch for operating said wrench to permit said shaft to rotate clockwise or counter-clockwise,

said handle of said ratchet wrench being disposed adjacent to the driver's seat and secured to said bracket,

said rotatable shaft being disposed parallel to said seat, and a backrest secured to said rotatable shaft and disposed rearwardly of said driver's seat in position to bear against the back of the driver.

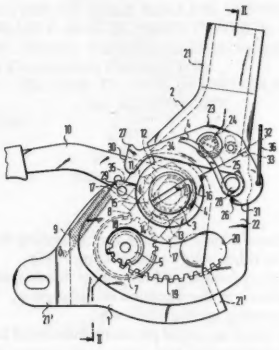
operation of said switch permitting said shaft to rotate and to move said backrest into and out of operative relation with the motorcycle driver sitting on said seat.

3,887,232

HINGE ARRANGEMENT FOR A FOLDING CAR SEAT

Emil Dinkel, Weidach, Germany, assignor to Metallwerk Max Brose & Co., Coburg, Germany

Filed May 7, 1974, Ser. No. 467,626
Claims priority, application Germany, June 6, 1973, 2328908
Int. Cl. B60n *1/02*
U.S. Cl. 297—367 8 Claims



1. A hinge arrangement for a seat of a motor car comprising:

a. first, second, and third hinge plate members;

b. a pivot pin connecting said members for relative angular movement thereof about a first axis;

c. first engaging means mounted on one of said second and third members for pivoting movement about a second axis;

d. two second engaging means on the other one of said second and third members and alignable with said first engaging means respectively by pivoting of said second and third members relative to each other about said first axis between two terminal positions,

1. respective portions of said second and third members enveloping said first axis and being axially juxtaposed,

2. respective other portions of said second and third members projecting from said juxtaposed portions in a direction away from said axis,

3. the combined axial thickness of said juxtaposed portions being approximately equal to the axial thickness of one of said other portions,

4. said one portion being axially coextensive with each of said juxtaposed portions;

e. yieldably resilient means biasing said first engaging means toward engagement with the aligned second engaging means; and

f. securing means for securing said second member to said first member in each of a plurality of angular positions, said securing means including

1. a toothed segment on said second member circularly arcuate about said first axis,

2. a toothed wheel rotatably mounted on said first member in meshing engagement with said segment, and

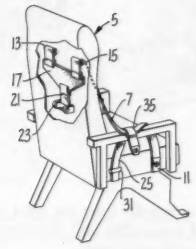
3. blocking means for blocking rotation of said wheel.

3,887,233

SHOULDER HARNESS AND LAP BELT RESTRAINT SYSTEM

Albert P. Garavaglia, Saratoga, and Dennis S. Matsuhiro, San Jose, both of Calif., assignors to The United States of America as represented by the National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Continuation of Ser. No. 282,738, Aug. 22, 1972, abandoned.
This application Mar. 19, 1974, Ser. No. 452,767
Int. Cl. A62b *35/00*
U.S. Cl. 297—389 8 Claims



1. A restraint system for safely and securely restraining a person to a chair when a severe chair deceleration is encountered comprising:

a chair having a back section for supporting said person's torso and a seat section for supporting said person's buttocks, said seat section having a forward portion remote from said back section and a rearward portion near said back section;

first and second shoulder straps each having first and second ends;

said first ends of said shoulder straps being fastened to said forward portion of said seat section and said first ends being spaced approximately the width of said person's thighs;

first and second lap straps each having first and second ends;

first and second spring-loaded, acceleration-sensitive strap retractors located at said rearward portion of said seat seciton and connected to said first ends of said first and second lap straps, respectively.

said first and second retractors being spaced approximately the width of said person's buttocks;

means for buckling together said second ends of said lap straps, said buckling means being substantially on an imaginary line vertically bisecting said person;

said first and second lap straps each having an eye adjacent said second ends;

said shoulder straps being threaded through said eyes, respectively, and said lap straps being free to move along said shoulder straps; and

third spring-loaded, acceleration-sensitive strap retractor secured to said back section and connected to said second ends of said shoulder straps, respectively.

3,887,234

FURNITURE SUBFRAME

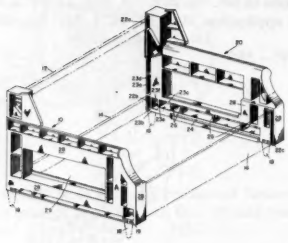
William R. Curtis, New Castle, and David C. Trimble, Yorklyn, both of Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Mar. 28, 1974, Ser. No. 455,774
Int. Cl. A47c *7/00*
U.S. Cl. 297—440 4 Claims

1. A furniture subframe comprising:

a pair of symmetrical load bearing, unitary, plastic subframes, each of said subframes being comprised of a plurality of joined plate sections, said subframes being

disposed in essentially parallel, mirror image like spaced apart relationship to each other, each of said subframes including at least one load bearing recepticle integral with said subframe, said recepticles each having at least four plate sections each connected at one end thereof to and



radiating outwardly from the sides of said recepticles to brace said recepticles and interconnect said recepticles with said subframes; and

an interconnecting member having opposite ends thereof contained within said recepticles to connect said subframes.

3,887,235

ASSEMBLY FOR HYDRAULIC EXTRACTION OF SHEET-LIKE MINERAL DEPOSITS SECTIONED INTO PANELS BY A SYSTEM OF PASSAGEWAYS

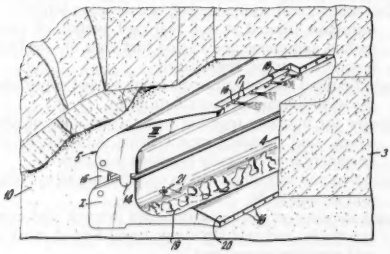
Manfred Koppers, Duisburg, Germany, assignor to Rheinstahl AG, Germany

Filed Feb. 11, 1974, Ser. No. 441,481

Claims priority, application Germany, Feb. 15, 1973, 2307413

Int. Cl. E21c *25/60*

U.S. Cl. 299—1 **17 Claims**



1. In an assembly for hydraulic extraction of a sheet-like mineral deposit, which has been sectioned by a system of passageways into panels limited laterally by roadways extending parallel to the direction of advance of the workings, by a hydromechanically operating device including at least one high pressure hydraulic nozzle mounted on a supporting structure and adapted to dislodge the working face of the deposit, extending between the roadways, by a high pressure jet of hydraulic fluid; the improvement comprising, in combination, said supporting structure including a single rectilinear shield-like structural member, having a channel cross-section open toward said working face, and which is rigid longitudinally against bending and extends, parallel to said working face, between two roadways; drag means extending along the two roadways and acting on respective opposite end portions of said structural member to move the latter in said direction of advance; and a plurality of high pressure hydraulic nozzles movably mounted on said structural member for discharging high pressure jets of hydraulic fluid against said working face over the entire length thereof.

3,887,236

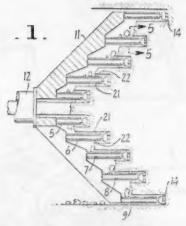
APPARATUS AND METHOD FOR CUTTING AND BREAKING ROCK

James G. Patrick, Hillsborough, Calif., assignor to Bechtel International Corporation, San Francisco, Calif.

Filed June 15, 1973, Ser. No. 370,388

Int. Cl. E21b *9/18;* **E21c** *41/00*

U.S. Cl. 299—10 **8 Claims**



1. A continuous mining machine for excavating an in-place mass of rock or other solid material comprising

a plurality of concentric annular cutter heads spaced apart and echeloned in the direction of excavation;

means for rotating said cutter heads;

at least one cutter mounted on each cutter head for cutting an annular groove in said mass as the cutter heads advance; and

breaking means for applying breaking force to undisturbed bands of material between said grooves cantilevered from said in-place mass, said breaking means being mounted behind said cutters and including a breaking wheel supported within the annular cutter head and extendible radially from the annular cutter head to apply a breaking force to the adjacent band of undisturbed material, and reaction means operatively connected with the breaking wheel to distribute the breaking force reaction from the breaking wheel to the in-place mass.

3,887,237

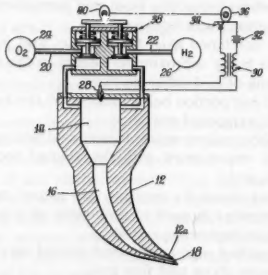
RIPPER WITH REPETITIVE EXPLOSIVE DEVICE FOR ROCK BREAKING

John M. Bailey, Dunlap, and Delwin E. Cobb, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed June 7, 1973, Ser. No. 367,727

Int. Cl. A01b *13/08*

U.S. Cl. 299—13 **4 Claims**



1. A method of fracturing rock or hard soil formations comprising:

providing a ripper shank having a width that is less than the thickness thereof and a pointed tip, a combustion chamber, and converging passage communicating said chamber with a forwardly directed port in said tip of said shank;

forcing the tip of said shank into a solidified formation to create fissures forward thereof;

introducing a combustible gaseous mixture into said fissures created by said ripper shank by way of said port; and

igniting said gaseous mixture in said fissures by generating a detonation wave in the combustion chamber which propagates along said converging passage into said fissures.

3,887,238

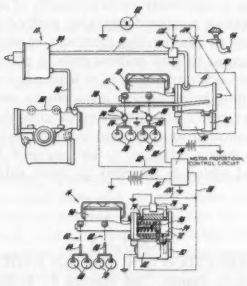
TRACTOR-TRAILER BRAKING SYSTEM WITH VARIABLE MOTOR SPEED CONTROL DEVICE

Ronald W. Bennett, Miamisburg, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 13, 1974, Ser. No. 450,839

Int. Cl. B60t *13/16*

U.S. Cl. 303—7 **4 Claims**



1. A vehicle tractor and trailer brake system comprising:

a tractor brake system including means generating pressure for system brake operation in accordance with the braking effort demand of the vehicle operator,

a trailer brake system including a brake booster having as a power pressure source a pump and a variable speed electric motor driving said pump to generate the booster power pressure,

pressure transducer means in said tractor brake system sensing the pressure of and the amount of said generated pressure,

and an electric motor control circuit electrically connected to said pressure transducer means and said electric motor to control the operation of said pump in accordance with the sensing action of said transducer to generate booster power pressure in said tractor brake system brake booster which is directly proportional to the sensed pressure generated in said tractor brake system.

3,887,239

METHOD AND APPARATUS FOR CONTROLLING THE SPEED OF A VEHICLE

Thomas H. Engle, Cape Vincent, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Mar. 5, 1973, Ser. No. 337,990

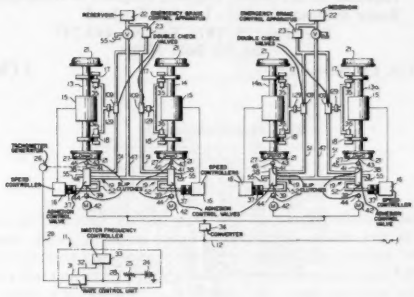
Int. Cl. B60t *8/06*

U.S. Cl. 303—21 B **16 Claims**

1. A vehicle control system having brakes for controlling the several wheels of a vehicle and control apparatus governing braking in accordance with sensing desired and actual vehicle speeds wherein the improvement comprises;

a. first means for sensing a desired speed for the vehicle,

b. second sensing means for sensing actual tangential tread speed for one wheel of the vehicle and for generating a feedback signal characteristic of the speed of the wheel,



c. frequency generating means governed jointly by the first sensing means and the feedback signal of the second sensing means for generating a master frequency signal,

d. adhesion control means for selectively governing braking torque on said one wheel in accordance with a comparsion of the master frequency signal and the tangential tread speed sensed by the second sensing means.

3,887,240

ANTILOCK CONTROL SYSTEM FOR VEHICLES

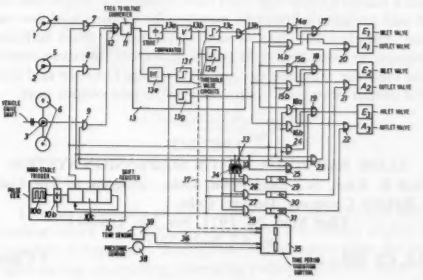
Heinz Leiber; Jurgen Gerstenmeier, both of Leimen, and Wolfgang Korasiak, Ketsch, all of Germany, assignors to Teldix GmbH, Heidelberg, Germany

Filed Dec. 6, 1973, Ser. No. 422,145

Claims priority, application Germany, Dec. 6, 1972, 2259724; Aug. 7, 1973, 2339912

Int. Cl. B60t *8/08*

U.S. Cl. 303—21 P **38 Claims**



1. An antilock control system for the braking system of a wheeled vehicle comprising at least two sensors, each associated with a different wheel or group of wheels of the vehicle and providing signals related to the rotary behavior of the wheels, an evaluation channel for evaluating signals fed to it from said sensors, first switching means for connecting said sensors to said evaluation channel in succession in a rhythm independent of the control channels for controlling brake pressure at the wheels associated with said sensors, second switching means acting in synchronism with said first switching means for switching the output of said evaluation channel in succession to said control channels, and storage means connected into said control channels for storing signals from said evaluation channel for use in the associated control chan-

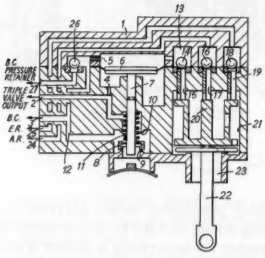
nel when said associated control channel is disconnected by said second switching means from said evaluation channel.

3,887,241

BRAKE CYLINDER RELEASE VALVES

David John Wickham; Jack Washbourn, and Philip Norman Paginton, all of London, England, assignors to Westinghouse Brake & Signal Co. Ltd., London, England

Filed Feb. 19, 1974, Ser. No. 443,747
Int. Cl. B60t *15/02*
U.S. Cl. 303—68 **3 Claims**



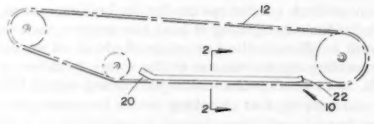
1. A brake cylinder release valve device for interposing in a fluid path between a brake cylinder and a fluid operable brake control valve and operable to close said path and vent the brake cylinder, said release valve device comprising a fluid pressure input port for connection to a control valve and a fluid pressure output port for connection to a brake cylinder, a pressure difference responsive member, a vent communicable with said output port, valve means operable by said pressure responsive member for normally opening the passage between said input and output ports and closing said vent, a relatively restricted fluid connection between said output port and one side of said pressure responsive member but clear of the flow path from said output port to said vent, a relatively less restricted fluid connection between said input port, said vent and the other side of said pressure responsive member, and a manually operable vent valve connected to said one side of said pressure responsive member for venting said one side and reversing the state of said valve means when sufficient pressure exists at the input port to move said pressure responsive member, whereby to close the passage between said input and output ports and open said vent to said output port.

3,887,242

SLIDE BAR FOR A TRACK SUSPENSION SYSTEM

Paul E. Russ, Sr., Englewood, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Mar. 22, 1971, Ser. No. 126,811
Int. Cl. B62d *55/10*
U.S. Cl. 305—24 **7 Claims**



1. In a wheel substitute land vehicle of the type having at least one endless track with an inner surface, frame means for suspending the track from the vehicle, and means in cooperation with the frame means for supporting the inner surface of the track, wherein improvement in the support means comprises:

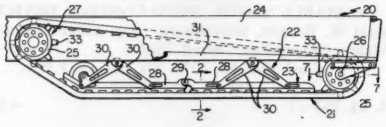
at least one slide bar suspended from the frame means to be in substantially longitudinal alignment in relation to the track, said slide bar having a track engaging surface for engaging and supporting the track along the inner surface, the track engaging surface having at least one groove which defines edges near the track engaging surface.

3,887,243

ENDLESS TRACK

Guy Noel Chaumont, Tring-Jonction, Quebec, Canada, assignor to Dayco Corporation, Dayton, Ohio

Filed Apr. 22, 1974, Ser. No. 463,072
Int. Cl. B62d *55/24*
U.S. Cl. 305—24 **20 Claims**



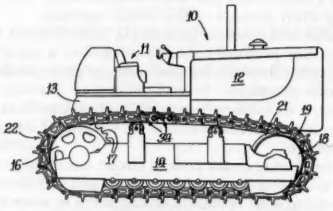
1. An endless track adapted to be moved in an endless path and comprising, a main body made primarily of an elastomeric material and having a ground engaging surface an inside surface, a plurality of reinforcing members extending substantially perpendicular to said endless path, a plurality of openings in said main body arranged in at least one rectilinear row with each opening being closely adjacent an associated reinforcing member, and a plurality of metal clips each supported in clamped relation around an associated reinforcing member and each clip being adapted to be engaged by a toothed sprocket wheel which is adapted to drive said track in its endless path.

3,887,244

RESILIENT MID-PITCH LUG FOR AN ENDLESS TRACK

Glenn M. Haslett, Peoria, and Harold L. Reinsma, Dunlap, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 30, 1973, Ser. No. 420,720
Int. Cl. B62d *55/08*
U.S. Cl. 305—57 **11 Claims**



1. In an endless track assembly of the type used on a vehicle provided with a drive sprocket having teeth and notches alternately disposed about the circumference of the sprocket, said track assembly comprising a pair of laterally unstanding link elements; parallel pin and bushing elements secured to and interconnecting respectively opposite ends of the links; a track shoe secured to the bottoms of said links; the improvement comprising a resilient impact lug reinforced by reinforcing means including a wear resistant material secured to the contact end of said impact lug, said lug being releasably secured to the shoe midway between the bushing elements, said impact lug having a topmost portion of greater height from the track shoe than the topmost portion of the adjacent bushings whereby initial contact is made by said lug so that impact

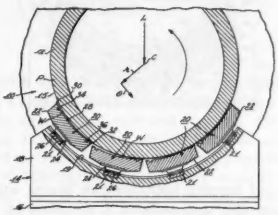
energy is absorbed by the lug prior to engagement of an adjacent bushing.

3,887,245

PIVOTED PAD BEARING APPARATUS AND METHOD FOR BIDIRECTIONAL ROTATION

Keith E. Rouch, Greendale, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Apr. 8, 1974, Ser. No. 459,120
Int. Cl. F16c *17/06*
U.S. Cl. 308—1 R **12 Claims**



1. In combination a rotable journal, a pivoted bearing pad in supporting relation to said journal for bidirectional rotation of said journal, stationary structure supporting said pivoted bearing pad for pivotal movement, said pivoted bearing pad including a journal bearing surface extending in a generally circumferential and also in a generally axial direction of said journal whereby to be in supporting relation to said journal for bidirectional rotation of said journal, said journal bearing surface including opposite circumferentially spaced first and second edges, said first and second edges being respectively the leading and the trailing edges for one direction of rotation of said journal, said first and second edges being respectively the trailing and the leading edges for the opposite direction of rotation of said journal, said leading edge being at the circumferential end of said pivoted bearing pad first reached by a given point on the periphery of said journal for any given direction of rotation of said journal, said trailing edge being at the circumferential end of said pivoted bearing pad last reached by said given point for any given direction of rotation of said journal, said bearing pad including a pivotal support located substantially midway between said first and said second edges, a first and a second lubricant discharge means in the journal bearing surface of said pivoted bearing pad respectively contiguous but spaced from said first and said second edges, means effective on both directions of rotation of said journal for connecting a pressurized supply of lubricant to the lubricant discharge means contiguous the leading edge of said pivoted bearing pad for any given direction of rotation of said journal, and for discontinuing the flow of lubricant to the lubricant discharge means contiguous the trailing edge of said pivoted bearing pad for any given direction of rotation of said journal, whereby to provide a lubricant film pressure profile at said journal bearing surface of said bearing pad which causes an offset pivot effect particular for each direction of rotation of said journal member while still maintaining a mechanically centrally located pivot for said pivoted bearing pad.

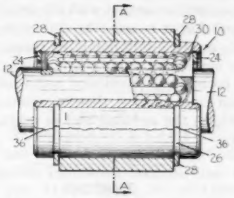
3,887,246

ANTI-FRICTION BALL BEARING ASSEMBLY

Albert R. McCloskey, Fairfield, Conn., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jan. 17, 1974, Ser. No. 434,355
Int. Cl. F16c *17/16*
U.S. Cl. 308—6 C **8 Claims**

1. An anti-friction ball bearing assembly, adapted for mounting within a housing comprising an outer sleeve and an inner sleeve concentrically fitting within said outer sleeve, said inner sleeve having a central opening for the passage of a shaft therethrough, said inner sleeve having a number of tracks defining paths for the circulation of balls between said sleeves and said shaft during movement between said shaft and said bearing assembly, said balls, during a portion of their circulation path, contacting said shaft and the inner surface of said outer sleeve at a plurality of raceway surfaces provided thereon, said outer sleeve having a longitudinal fracture line such that said outer sleeve acts as a biasing means on said balls to effect a preloaded force between said shaft and said balls and said outer sleeve.

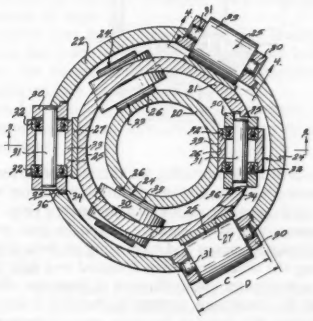


3,887,247

BEARING MOUNTING FOR TELESCOPING TUBES

Johan E. A. Graae, Elmhurst; Aloysius R. Jamrog; Anthony S. Kelecius, both of Chicago, and Donald P. Mingesz, Naperville, al of Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 25, 1974, Ser. No. 445,739
Int. Cl. F16c *29/04*
U.S. Cl. 308—6 B **2 Claims**



1. In an assembly of telescoping tubes including at least a hollow outer tube with an inner tube positioned within and capable of translation through the hollow outer tube, the outer tube having an opening extending radially from the inner wall of the outer tube, and a bearing mounted in a mounting structure positioned on the outer tube in rotatable contact with said inner tube, said mounting structure for the bearing comprising; a shelf in the form of a portion of the inner wall of the outer tube extending outwardly from the perimeter of the opening recessed from surrounding portions of the inner wall, and a mounting piece for holding and positioning the bearing, said mounting piece having a first end from which said bearing protrudes and a second end on the opposite side of said mounting piece from said first end, said second end being of cross sectional configuration capable of being inserted into the opening and having a shoulder in the form of a solid projection extending outwardly from the body of said mounting piece between said first end and said second end, the cross section of said mounting piece through said shoulder being of

such shape that with said second end of said mounting piece positioned within said opening said cross section of said mounting piece through said shoulder extends beyond the opening at the inner wall and is encompassed within said recess and said shoulder is in contact with said shelf so that with said mounting piece positioned within the opening said bearing is in rotatable contact with the exterior surface of the inner tube and forces exerted by the inner tube against the bearing act to displace said mounting piece radially from and axially to the inner tube, said shelf in contact with said shoulder and said second end positioned within said opening acting to oppose said displacement, thereby maintaining the bearing in position within the opening and in rotatable contact with the inner tube.

3,887,248

SLIDE-ARTICULATION BEARING FOR TILTABLE CONVERTERS

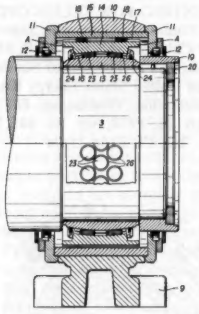
Ernst Riegler, Enns, Austria, assignor to Vereinigte Osterreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Mar. 27, 1973, Ser. No. 345,292

Claims priority, application Austria, Mar. 28, 1972, 2664/72

Int. Cl. F16c *13/04, 17/10*

U.S. Cl. 308—15 **11 Claims**



1. A slide-articulation bearing for tiltable converters comprising a bearing housing, and in said housing an inner ring, an outer ring, and between said inner and outer rings a cage having recesses, and slide elements fixed in said recesses, framed by particular means and supporting on their slide faces the inner ring; the outer ring being designed as a slide bushing and having on an outer circumference at least one slide face integral with the outer ring, so that the bearing is axially displaceable within the bearing housing, the outer ring being made of unalloyed, quenched and tempered carbon steel with a strength of 55 to 70 kp/mm².

3,887,249

JOURNAL BEARING FOR SUPPORTING BOTH RADIAL LOADS AND AXIAL THRUST LOADS

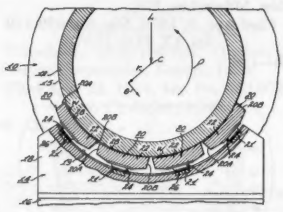
Keith E. Rouch, Greendale, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Apr. 8, 1974, Ser. No. 459,116

Int. Cl. F16c *17/06*

U.S. Cl. 308—73 **11 Claims**

1. In combination, a rotatable journal member, a pivoted pad bearing supporting said journal member for rotation, stationary structure supporting said pivoted pad bearing for pivotal movement, said pivoted pad bearing including a journal bearing surface extending in a generally circumferential and also in a generally axial direction of said journal member whereby to journal said journal member for rotation, said journal member including a thrust shoulder contiguous an axial end of said pivoted pad bearing, said pivoted pad bearing including at an axial end thereof a thrust surface adapted to cooperate with said thrust shoulder whereby to resist axial thrust forces on said journal member, said thrust shoulder on said journal member and said cooperating thrust surface on



said pivoted pad bearing both lying in planes substantially parallel to each other and inclined to the plane of the radial load-circumferential load on said journal bearing surface, whereby to minimize the moment induced on said pivoted pad bearing by the resultant force acting on said thrust surface.

3,887,250

GODET FOR USE IN DRAWING APPARATUS AND DRUM DRYER UNITS

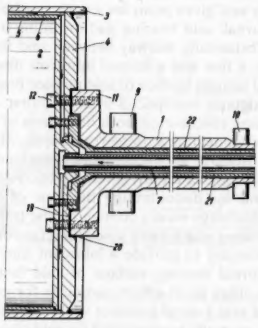
Heinz Fleissner, Frankfurt am Main, Germany, assignor to VEPA AG, Switzerland

Division of Ser. No. 221,941, Jan. 31, 1972, Pat. No. 3,831,666, which is a continuation-in-part of Ser. No. 121,890, March 8, 1971, Pat. No. 3,738,423. This application June 21, 1974, Ser. No. 481,824

Claims priority, application Germany, Jan. 30, 1971, 2104392

Int. Cl. F16c *37/00*

U.S. Cl. 308—76 **6 Claims**



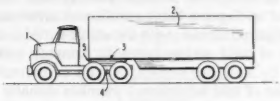
1. A godet comprising a cylindrical shell for transporting fiber, a rotatable bearing shaft secured to an end wall of said cylindrical shell, a lubricated bearing for allowing rotation of said shaft, a lubricant seal for the shaft, said shaft being disposed in a bearing housing and extending toward the outside of the housing through a wall of the housing, said godet being characterized in that underneath the shaft and underneath the lubricated bearing, a lubricant return means is provided in the housing wall for directing leaking lubricant back into said housing.

3,887,251

TRACTOR AND TRAILER FIFTH WHEEL BEARING ATTACHMENT

Roy H. McKay, 6305 Mahoning Ave., Youngstown, Ohio 44515

Filed Aug. 6, 1974, Ser. No. 495,252
Int. Cl. B62d 53/08
U.S. Cl. 308—136 6 Claims



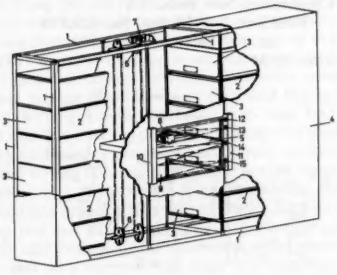
1. In a fifth wheel assembly including an upper trailer plate mounting a king pin and a lower slotted tractor plate adapted for locking engagement with said king pin, the improvement comprising an anti-friction device between said fifth wheel plates, said device comprising a bushing journaled on the king pin, a first bearing plate detachably secured to the upper trailer plate, said first bearing plate being centrally apertured for receiving the upper end portion of said bushing, a flange at the bottom of said bushing, a second bearing plate mounted for rotation on said flanged bushing, a split washer connected to the second bearing plate and engaging the flange of the bushing for holding the bushing in operative position on said king pin, said second bearing plate being frictionally engageable with and by said tractor plate and rotatable therewith, and a third plate positioned between said first and second bearing plates and mounted for free rotation about the bushing, said third plate incorporating lubricating means on both surfaces to substantially eliminate friction between said first and second bearing plates.

3,887,252

LIGHT OPERATED GUARD

Paul Fuller, Romford, England, assignor to Roneo Vickers Limited, London, England

Filed Dec. 4, 1973, Ser. No. 421,719
Claims priority, application United Kingdom, Dec. 6, 1972, 56370/72
Int. Cl. A47b 77/08
U.S. Cl. 312—223 7 Claims



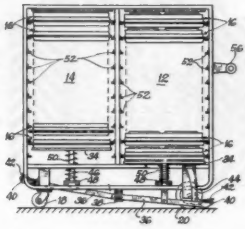
1. A light operated guard for a path which may be traversed by a person or part of a person, for the purpose of raising an alarm, closing the path or stopping dangerous machinery or the like in said path, comprising means for producing a beam of light, means for modulating the beam of light at a predetermined and substantially constant frequency, a system of mirrors positioned adjacent boundaries of the path for reflecting the beam of light back and forth across the path, a photosensitive electrical device at the end of the beam of light remote from the means for producing a beam of light for generating an electric signal of said predetermined frequency, and an electric circuit connected to said photo-sensitive device for producing an output signal responsive to said electric signal only when the light of said predetermined frequency and of a predetermined amplitude falls on said photo-sensitive device, said electric circuit including means activated by said output signal for inhibiting the raising of an alarm, the closing of the path or stopping of dangerous machinery or the like, whereby interruption of said beam of light will prevent production of said output signal thereby precluding activation of said inhibiting means.

3,887,253

FOOD SERVICE CART

John A. Bridges, and W. Burk Wyatt, both of Nashville, Tenn., assignors to Aladdin Industries, Incorporated, Chicago, Ill.

Filed Jan. 14, 1974, Ser. No. 433,069
Int. Cl. A47b 67/02
U.S. Cl. 312—250 11 Claims



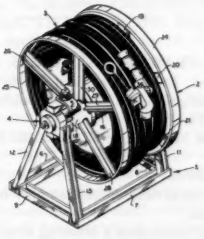
1. An institutional food delivery system for maintaining food temperature constant during transporting comprising:
food trays capable of nesting one on top of the other to form a stack of trays;
a portable cart having at least one side loading compartment for receiving said trays therein, and including
means for nesting said trays in said compartment during transport to a desired location, and
means for supporting said trays in an unnested condition to permit loading and unloading from the side of said compartment.

3,887,254

ELECTRIC GROUNDING APPARATUS

Alfred R. Landis, Decatur, Ga., and Sammie B. Torrence, Carthage, Tenn., assignors to Kearney-National Inc., Atlanta, Ga.

Filed Jan. 25, 1974, Ser. No. 436,749
Int. Cl. H01r 39/00
U.S. Cl. 339—5 R 8 Claims



1. Electric grounding apparatus comprising a conductive frame arranged for connection to a device to be grounded, a conductive reel rotatably mounted on said frame, flexible conductive grounding means electrically connected with and

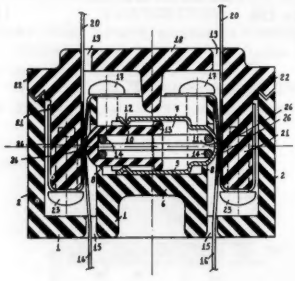
adapted to be wound on said reel, bearing means rotatably mounting said reel on said frame, and shunt means of substantially less impedance than said bearing means and electrically interconnecting said reel and said frame, said shunt means comprising magnetic means secured to and electrically connected with said frame and forming a slidable contact with said reel.

3,887,255

MULTIPLE COUPLING CONNECTOR FOR ELECTRICAL CONNECTION

Giuseppe Codrino, Via Stazione, Quattordio, Italy

Filed May 31, 1973, Ser. No. 365,764
Claims priority, application Italy, June 16, 1972, 25788/72
Int. Cl. H05k *1/02*
U.S. Cl. 339—17 L **8 Claims**



1. An apparatus for the multiple electrical connection of ribbon-like conductors, comprising a first element formed with an elongated recess bounded by an inner peripheral wall surface and having an open end and a longitudinally spaced closed end; a pair of transversely spaced first apertures formed in said first element at said closed end and communicating with said recess, so that first ribbon-like conductors may be inserted through said apertures to overlie said inner wall surface at transversely spaced locations; a second element formed with an elongated projection receivable with clearance in said recess through said open end thereof, and with a wall portion which overlies said open end when said projection is received in said recess, said projection having an outer peripheral wall surface and said transverse wall having a pair of transversally spaced second apertures through which second ribbon-like conductors may be inserted to overlie said outer wall surface so as to be each juxtaposed with one of said first ribbon-like conductors when said projection is received in said recess; and biasing means in said projection and operative to deflect said second ribbon-like conductors outwardly away from said outer wall surface and into conductive contact with the respectively juxtaposed first ribbon-like conductors.

3,887,256

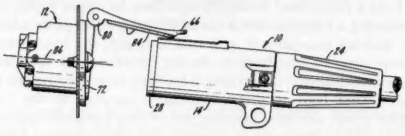
TRACTOR-TRAILER ELECTRICAL CONNECTOR

Boleslaw Klimek, Des Plaines, and Victor Mastis, Hinsdale, both of Ill., assignors to The Berg Manufacturing Company, Des Plaines, Ill.

Filed Mar. 27, 1973, Ser. No. 345,349
Int. Cl. H01r *13/44*
U.S. Cl. 339—44 M **3 Claims**

1. In an electrical connector assembly having a connector and a receptacle,

said connector including a housing, a cable receiving aperture at one end thereof, a flexible cable support attached to said housing at said cable receiving aperture, said cable support being formed of a material to be in sealing contact with a cable therein, a plurality of female contact members positioned within the housing adjacent the opposite end thereof, and a plurality of openings in said opposite end in alignment with said female contact members, a cable clamp within said connector housing including a clamp member and a spring having end portions and a central portion positioned about said clamp member, an adjustment member engaging said spring and urging said clamp member into engagement with a cable therein, said clamp member having a generally arcuate outer surface including a groove and an inner surface formed and adapted to mate with a cable outer surface, said central portion of said spring being positioned within said groove of said clamp member, with the outer surface of said end portions of said spring being in contact with and restrained by an inner surface of said connector housing, movement of said adjustment member radially inward of said housing causing at least said central portion of said



spring to translate radially of said housing and apply greater clamping pressure upon said clamping member and the cable positioned within the housing,

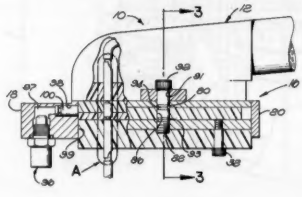
said receptacle including a housing, a plurality of cable receiving apertures at one end thereof, the opposite end of said housing having an opening and a cover therefor, a plurality of male contact members in said receptacle housing in alignment with said apertures, said male contact members being adapted to be inserted in said female contact members when said connector and receptacle are assembled, mounting means attached to said receptacle housing, the longitudinal axis of said receptacle housing forming an angle with said mounting means which is slightly different from 90° and sufficient to cause any moisture within said receptacle housing to accumulate adjacent the cover thereof.

3,887,257

ELECTRICAL CONNECTOR

George J. Panek, Phoenix, and Michael E. McCrea, Tempe, both of Ariz., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 2, 1974, Ser. No. 429,598
Int. Cl.[2] H01R *13/62, 25/00*
U.S. Cl. 339—45 M **15 Claims**



1. A switching electrical connector comprising:

plug and receptacle connector members;

a fixed insulator in each of said connector members carrying aligned "butt" contacts;

a movable insulator in one of said connector members mounted for sliding movement laterally between said fixed insulators from a first position to a second position;

a bore in said movable insulator extending perpendicular to the path of movement of said movable insulator, in said first position of said movable insulator said bore therein

being aligned with said "butt" contacts and in said second position of said movable insulator said bore being out of alignment with said "butt" contacts;

a pair of movable contacts in said bore;

means biasing said movable contacts apart urging said movable contacts to extend outwardly beyond the opposite faces of said movable insulator so that when said movable insulator is in said first position, said movable contacts will engage said "butt" contacts; and

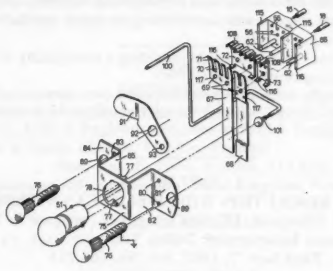
means on said one connector member for shifting said movable insulator from said first position to said second position to break the engagement between said movable contacts and said "butt" contacts.

3,887,258

WIRE CONNECTOR MEANS FOR VEHICLE LAMP

Alton J. Cunningham, Slinger; David W. Wendt, Janesville, and Bernard R. Weber, Elm Grove, all of Wis., assignors to Wesbar Corporation, West Bend, Wis.

Filed Nov. 30, 1973, Ser. No. 420,646
Int. Cl. H01r *9/12*
U.S. Cl. 339—95 D **20 Claims**



1. As a wire connection means in a vehicle lamp: an insulated housing having walls defining a cavity, at least one of said walls having a wire receiving opening extending therethrough; an electrically conductive contact plate rigidly mounted within said cavity and comprising a base portion and a free-standing portion extending transversely from said base portion in a direction away from said one wall; said base portion being provided with a wire receiving hole in registry with said wire receiving opening and said free-standing portion being provided with a wire receiving groove in alignment with said wire receiving hole in said base portion; an electrically conductive contact member electrically connected to said base portion of said contact plate and having a curved resilient locking tongue extending from said base portion toward said free-standing portion; and means for mechanically securing said contact plate and said contact member to each other and to said housing; said locking tongue terminating in an edge, said locking tongue being resiliently movable to accommodate insertion of a wire through said wire receiving opening and said wire receiving hole and along said groove between said locking tongue and said upright portion and to entrap said wire between said edge and said free-standing portion of said contact plate.

3,887,259

CONNECTOR RETAINING ADAPTER

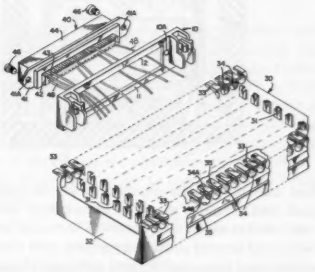
George E. Ayer, Endicott, N.Y., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Oct. 17, 1973, Ser. No. 407,127
Int. Cl. H01r *13/46*
U.S. Cl. 339—119 R **5 Claims**

1. A connector retaining adapter for mechanically joining an electrical connector and a wiring terminal block, said electrical connector having a mounting flange and a rear contact portion connected to a plurality of individual conductors, said terminal block having a foundation supporting a plurality of electrical terminals and at least one side with a raised ridge having a row of apertures therethrough normally receiving individual conductors, and an elongated recess of constant width extending below the apertures and parallel to said row, said adapter comprising:

a base for receiving the mounting flange of the electrical connector, said base including an opening for conductors from the electrical connector;

at least one flexible arm extending from each end of said base in a direction perpendicular thereto, each arm being shaped to pass through an aperture of the terminal block when flexed and with a latching portion extending laterally from the end of each arm, which latching portion



abuts against the back portion of the ridge when passed through an aperture; and

at least one stabilizing flange extending from each end of said base in the same direction as said flexible arms and in juxtaposition with each of said flexible arms, each stabilizing flange having

an upper portion of such dimensions from said base that when the latching portion of the juxtaposed flexible arm abuts the back portion of the ridge of said terminal block, said upper portion of the stabilizing flange abuts the opposite side of the ridge, and

a lower portion of such dimension from said base as to project beyond said upper portion and to the bottom of said elongated recess in said terminal block when the latching portion of the juxtaposed flexible arm abuts the back portion of the ridge of said terminal block.

3,887,260

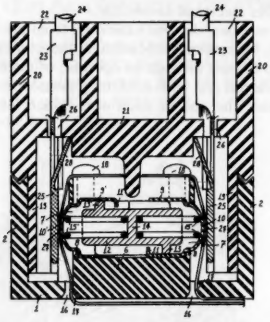
MULTIPLE COUPLING CONNECTOR FOR ELECTRICAL CONNECTION BETWEEN FLEXIBLE RIBBON-LIKE CONDUCTORS AND CIRCULAR CROSS-SECTION CABLES

Guiseppe Codrino, Via Stazione, Quattordio, Italy

Filed Apr. 17, 1973, Ser. No. 351,955
Claims priority, application Italy, June 16, 1972, 25787/72
Int. Cl. H01r *13/54*
U.S. Cl. 339—176 MF **13 Claims**

1. An apparatus for the multiple electrical connection of ribbon-like conductors with circular cross-section cables, comprising a first element formed with an elongated recess bounded by an inner peripheral wall surface and having an open end and a longitudinally spaced closed end; a second element formed with an elongated projection receivable with clearance in said recess through said open end thereof, and with a transverse wall portion which overlies said open end when said projection is received in said recess, said projection having an outer peripheral surface; a pair of transversely spaced first apertures formed in said first element at said closed end and communicating with said recess; a pair of transversely spaced second apertures formed in said second

element at said transverse wall and communicating with said recess so that ribbon-like conductors may be inserted through said second apertures to overlie said inner wall surface at transversely spaced locations; a pair of socket elements each formed with a first longitudinal portion having an end shaped to receive a circular cross-section cable and an other end, a second longitudinal portion having a conductive surface and extending from said other end of said first longitudinal portion into said recess, and a third longitudinal portion intermediate



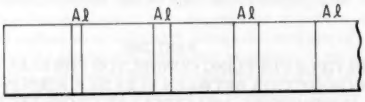
said first and second longitudinal portions and engageable with said first element so as to secure said socket element when said socket element is received in one of said first apertures with said second portion overlying said outer peripheral wall surface and being juxtaposed with one of said ribbon-like conductors; and biasing means in said projection and operative to deflect said ribbon-like conductors outwardly away from said outer wall surface and into conductive contact with said respectively juxtaposed second longitudinal portions of said socket elements.

3,887,261

LOW-LOSS REFLECTION COATINGS USING ABSORBING MATERIALS

Eberhard A. Spiller, Mt. Kisco, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 23, 1973, Ser. No. 344,405
Int. Cl. G02b *5/28, 5/30*
U.S. Cl. 350—1 **1 Claim**



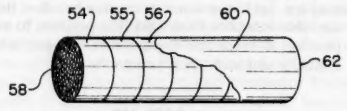
1. A reflective structure for optical waves comprising an array of alternate layers of high and low absorbing elements wherein said alternate layers are coated on top of each other, said array including a plurality of thin film elements having a relatively high absorption index separated by and coated on material having a relatively low absorption index to provide an alternating difference in said absorption indices to produce a plurality of reflecting boundaries which, when positioned in the path of an incident optical wave produce standing incident and reflected waves as a result of said differences in said absorption indices, said alternate layers being arranged relative to each other so that said high absorption elements are located in the nodes of said incident and reflected waves to form a nonperiodic structure wherein the thickness of the absorbing layers monotonically vary from one end of said array to the other, said thinner absorbing layers being located at the end of said array in the path of said incident optical wave.

3,887,262

LIGHT EQUALIZER AND METHOD OF MAKING SAME

Henry H. Blau, Jr., Wayland, and Paul L. Kebabian, Somerville, both of Mass., assignors to Environmental Research & Technology, Inc., Concord, Mass.

Filed Apr. 5, 1974, Ser. No. 458,124
Int. Cl. G02b *5/20, 5/14, 27/00*
U.S. Cl. 350—1 **10 Claims**



1. A light equalizer for providing substantially uniform distribution of light across an output aperture, said equalizer comprising in combination;

a plurality of light transmissive elements each having opposed surfaces, said elements being arranged in a stack substantially along a common axis with all of said surfaces, except the end surfaces of said stack, adjacent at least one other surface of another said element, said end surfaces respectively constituting an input aperture and said output aperture;

at least one of said elements providing a multiplicity of light scattering centers; and

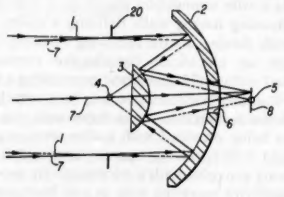
an internally reflective cover disposed over substantially all of the exterior surface of said stack, except said end surfaces.

3,887,263

HIGH RESOLUTION WIDE FIELD SCAN SYSTEM

William S. Thompson, III, McKinney, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 7, 1967, Ser. No. 666,215
Int. Cl. G02b *17/00*
U.S. Cl. 350—7 **16 Claims**



1. An optical system comprising:

a. a spherical primary mirror having an aperture therein,

b. an aspheric secondary mirror disposed to intercept rays from said primary mirror, and

c. means for rotating said aspheric secondary mirror about the optical axis of said primary mirror,

d. an entrance pupil located at the center of curvature of said primary mirror, whereby rays entering the system through said pupil are reflected by said primary mirror to said aspheric secondary mirror and thence through said aperture to focus at a point behind said primary mirror.

3,887,264

OPTICAL FIBER WITH ASYMMETRIC INDEX PROFILE

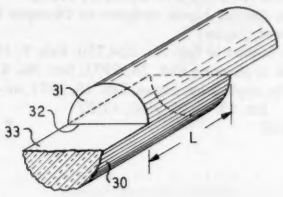
Rudolf Kompfner, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 18, 1973, Ser. No. 361,516
Int. Cl. G02b *5/14*
U.S. Cl. 350—96 WG **5 Claims**

1. A pair of optical waveguides, each of which includes an elongated core, characterized in that:

each waveguide has a region along which the core portion has at least one planar surface that extends in a direction parallel to the direction of wave propagation;

the refractive index of each of said core portions decreases continuously in a transverse direction from a maximum at a point along said planar surface, to a minimum at the surfaces of said core;



the planar surfaces of said core portions overlap and are in contact to form a splice;

and in that said overlapping core portions are surrounded by material having a refractive index that is no greater than the minimum refractive index at said core surfaces.

3,887,265

OPTICAL GUIDES

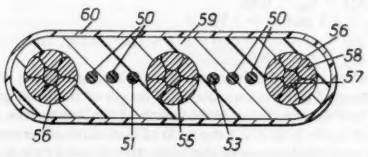
David Saul Margolis, London, and John Edward Taylor, Cookham, both of England, assignors to British Insulated Callender's Cables Limited, London, England

Filed Nov. 8, 1973, Ser. No. 413,826

Claims priority, application United Kingdom, Nov. 10, 1972, 52097/72

Int. Cl. G02b *5/16*

U.S. Cl. 350—96 B **20 Claims**



1. An optical cable comprising at least one optical bundle including a plurality of elongate optical elements, each consisting of at least one optical fibre, the optical elements being at least partially embedded in and mutually separated by encapsulating material in a predetermined configuration throughout substantially the whole length of the optical bundle, the encapsulating material being of such a nature that relative movement between the embedded optical elements is at least substantially reduced and that the position of each optical element, with respect to the positions of the other optical elements is maintained substantially constant to provide for ready identification of an optical element at any transverse cross-section along the length of the bundle, at least one separate elongate non-optical reinforcing member; and, surrounding the bundle or bundles and the reinforcing member or members, an outer protective sheath; the reinforcing member or members being of such a material and of such a cross-sectional area having regard to the material or materials and cross-sectional area of the bundle or bundles that the reinforcing member or members at least substantially reduce the strain that would otherwise be imparted to the or each bundle when the cable is stressed such a way as to tend to subject the or any optical fibre of the bundle to a tensile force.

3,887,266

CIRCULATING AIR OVEN

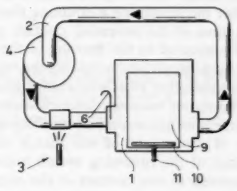
Pekka Juhani Saario, Martinkatu 31, Hyvinkaa, Finland

Filed Dec. 28, 1973, Ser. No. 429,173

Claims priority, application Finland, Oct. 16, 1973, 3204/73

Int. Cl. F27b *17/00*

U.S. Cl. 432—152 **3 Claims**



1. A circulating air oven for the baking of bakery products in flowing hot air, said oven comprising a baking chamber having an air inlet and outlet, a circulating air duct connected to said chamber at said inlet and outlet thereof, a heater for heating the circulating air in said air duct, a blower in said duct with a drive motor for circulating air through said duct and said baking chamber, and a shut-off means in said duct downstream of the blower for controlling the flow of air circulating to said chamber in order to control the air circulation in said chamber.

3,887,267

APPARATUS FOR ADJUSTING AN OPTICAL OBSERVATION DEVICE

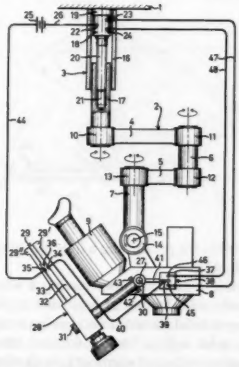
Rudolf Heller, Zurich, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Filed June 3, 1974, Ser. No. 475,859

Claims priority, application Switzerland, June 18, 1973, 8852/73

Int. Cl. G02b *21/24*

U.S. Cl. 350—85 **2 Claims**



1. An apparatus for adjusting an optical observation instrument, comprising:

an optical observation instrument having a housing,

a stand including an instrument support component, means for freely moving the support component in a substantially horizontal plane, adjustment motor means having two directions of movement for respectively adjusting the support component in vertical direction upwards and downwards,

bearing means having a substantially horizontally extending axis and supporting the housing of the instrument at the support component,

a preselection switch means incorporating two electrical contact pieces and having one closed-contact and one opened-contact position,

a reversing switch means incorporating one reversing electrical contact piece and two static electrical contact pieces and having two closed-contact positions of the reversing contact piece respectively with the one and the other static contact piece, the reversing switch means further incorporating a coupling element for mechanical actuation of the reversing contact piece and a housing rigidly secured to the housing of the instrument,

a switching circuit for energizing the motor means including the preselection switch means for turning-on and turning-off the motor means, each closed-contact position of the reversing switch means controlling one respective direction of movement of the motor means, the reversing contact of the reversing switch means being electrically connected to one contact of the preselection switch,

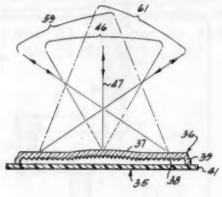
an adjustment element incorporating a lever arm rigidly connected to the coupling element and an end part constructed as a mouthpiece having two portions each rigidly connected to one respective contact of the preselection switch means and movable to approach each other against a restoring force when bitten together by an operator thereby to actuate the preselection switch means to the closed-contact position, and

pivot means having a substantially horizontally extending axis and supporting the adjustment element at the instrument housing while permitting pivotal movement of the adjustment element and of the coupling element connected thereto for actuating the reversing switch means to one of two closed-contact positions.

3,887,268
FLASHING REFLECTOR SYSTEM

Gerald Golden, Highland Park, and James D. Kennedy, Streamwood, both of Ill., assignors to Beatrice Foods Company, Elgin, Ill.

Continuation-in-part of Ser. No. 355,796, April 30, 1973, abandoned. This application Feb. 19, 1974, Ser. No. 443,476
Int. Cl. G02b *5/12*
U.S. Cl. 350—99 **5 Claims**



1. An assembly for producing a light flashing effect comprising in combination

A. a rotatable wheel member having a wheel axis,

B. a reflector unit having at least one region comprised of transparent solid material and having a region axis normal thereto, said region having formed therein a group of cube corner reflector elements, such elements each having a central optical axis, each respective such optical axis being both disposed substantially parallel to the respective such optical axes of the other such elements in said group, and inclined at a predetermined angle relative to said region axis, said region being retroreflective of light directed thereon at least over an angle of from about 20° to 70° relative to said region axis in the direction of said predetermined angle,

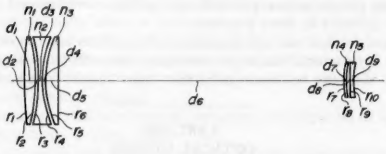
C. mounting means to mount said reflector fixedly to a side portion of said wheel member,

D. said wheel member, said reflector and said mounting means coacting together so that, when said wheel is rotated, said reflector is adapted to retro-reflect light intermittently so as to produce a flashing light signal viewable within a viewing angle of at least about 20° to 70° relative to said wheel axis once during each 360° of wheel rotation.

3,887,269
SUPERTELESCOPIC LENS SYSTEM

Jihei Nakagawa, Tokyo, Japan, assignor to Olympus Opitcal Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 224,720, Feb. 9, 1972, abandoned. This application Oct. 26, 1973, Ser. No. 410,256
Claims priority, application Japan, Feb. 10, 1971, 46-5377
Int. Cl. G02b *9/60, 13/02*
U.S. Cl. 350—216 **5 Claims**



1. A supertelescopic lens system comprising a positive single first lens, a negative single second lens, a positive single third lens, said first, second and third lenses forming a front group of the lens system, a positive single fourth lens, and a negative single fifth lens, said fourth and fifth lenses being separated from said front group of the lens system by a large air space, and the whole lens system being such that the four conditions

1. $0.45f < f_{123} < 0.6f$,
2. $n_2 > 1.7$ and $n_3 > 1.7$,
3. $0.20f < r_7 < 0.26f$ and $0.11f < r_{10} < 0.13f$, and
4. $0.45f < f_4 < 0.6f$

are satisfied where f is the composite focal length of the whole lens system, f_{123} the composite focal length of the front group of the lens system, f_4 the focal length of the fourth lens, and r_i, d_i and n_i (i=1, 2, 3, ...) the radii of curvature of respective lenses, axial thicknesses of the respective lenses or air spaces between adjacent lenses and refractive indexes of the respective lenses.

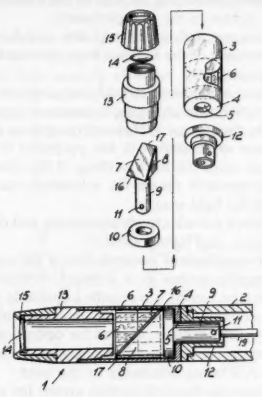
3,887,270
STYLUS DEVICE FOR THE VISION OF IMAGE SEQUENCES

Alfred Lazarus, and Jean-Jaques Lazarus, both of 2, Rue Friese, Strasbourg, France (67000)

Filed Apr. 3, 1974, Ser. No. 457,612
Claims priority, application Italy, Apr. 3, 1973, 22521/73
Int. Cl. G02b *27/02*
U.S. Cl. 350—241 **1 Claim**

1. Stylus device for viewing image sequences, comprising a cylindrical sleeve, an eyepiece situated in the proximity of one end of said sleeve, a plurality of photographic images disposed as a ring on the inner wall of said sleeve, and a 45° mirror situated in said sleeve in a position corresponding with said images, in which said sleeve is constructed of translucent material for the through illumination of the images over its entire extension along which said plurality of images is disposed, said mirror having a surface shaped substantially as an isosceles trapezoid with its minor base adjacent to, and its major base remote from the eyepiece, the surface of said

mirror being dimensioned in such a manner as to subtend an image or a whole number of images, said sleeve being rotatable with respect to said mirror, which is kept at rest with respect to the observer.



3,887,271
OPTICAL ELEMENT HAVING THEREIN PHOTOCHROMIC AND FLUORESCENCE-QUENCHING PATTERNS AND A METHOD FOR MANUFACTURING SAME

Kazunori Yamaguchi; Takeo Itimura; Teruo Kaneko, all of Tokyo, and Hiroshi Yamamoto, Kawasaki, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed June 19, 1974, Ser. No. 480,943
Claims priority, application Japan, June 25, 1973, 48-70762
Int. Cl. G01t *1/11*
U.S. Cl. 250—458 **12 Claims**

1. An optical element containing therein a pattern having photochromic and fluorescence-quenching properties and another pattern having the fluorescence-quenching property alone, which comprises in combination:

a. a fluorescent glass body containing therein an ion-exchangeable ion;

b. a first metal ion capable of inducing both photochromism and fluorescence-quenching; and

c. a second metal ion other than said first metal ion capable of inducing the fluorescence-quenching alone,

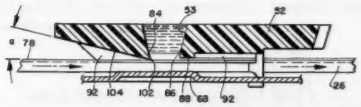
said ion-exchangeable ion in said glass body being ion-exchanged with said first and second metal ions to enable said metal ions to be penetrated into said glass body and to form the required patterns in the inner surface of said glass body.

3,887,272
PROCESSING FLUID DISCHARGING APPARATUS FOR MULTIPURPOSE FILM CASSETTES

Lucretia J. Weed, Boston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 13, 1973, Ser. No. 424,555
Int. Cl. G03c *11/00*
U.S. Cl. 352—130 **4 Claims**

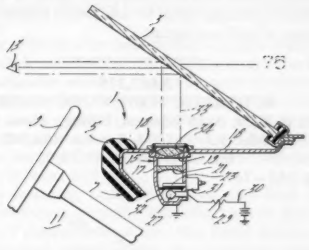
1. An applicator for treating with processing fluid an exposed strip of photographic film material having a light sensitive emulsion on one surface so as to develop viewable images on such film strip, said applicator comprising a housing including a chamber configured to receive such processing fluid, said housing including a processor nozzle having a surface formation configured to confront the emulsion layer on the film strip and having an opening through said surface formation for depositing a layer of processing fluid on at least a portion of such emulsion intermediate the margins of such film strip when relative motion is effected between such film strip and said housing so as to advance such film strip across said nozzle surface, said opening having leading and trailing edges in relation to the relative motion of such film strip during processing, said surface formation extending forwardly of said leading edge and rearwardly of said trailing edge, and said surface formation forwardly of said leading edge being inclined so such film strip so as to form with said film an angle converging towards said opening and terminating in a knife-like leading edge of said opening.



3,887,273
SPEEDOMETER OPTICAL PROJECTION SYSTEM

David Griffiths, North Plainfield, N.J., assignor to Conrad J. Friedemann, Bloomfield Hills, Mich.

Filed July 27, 1973, Ser. No. 383,244
Int. Cl. G03b *21/00, 21/28*
U.S. Cl. 353—14 **6 Claims**



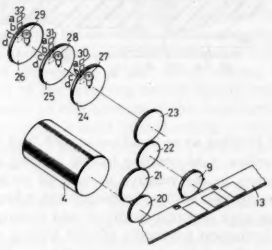
1. In a vehicle with an instrument panel including a speedometer or the like having a movable scale with indicia providing vehicle condition information for the vehicle operator, a system for projecting said information as a luminous image at infinite focus substantially in the operator's forward field of view comprising a transparent windshield concave to the interior of the vehicle and of substantially spherical curvature, a projection lens for projecting parallel light rays on the inside surface of said transparent windshield, a light source for illuminating said scale and located on the opposite side of the scale from the lens, and an optical correcting element in the system for sharply focusing said image to overcome aberration produced by the curvature of the windshield, said scale being positioned at less than the focal length of the projection lens to correct for focus shift produced by curvature of the windshield.

3,887,274

FILM FRAME SELECTING APPARATUS FOR A PROJECTOR

Kenjiro Kachi, Aichi; Morio Takeichi, Inazawa; Yasumasa Nakamura, Nagoya; Yoichi Inomata, Anjo, and Mitsuru Nakano, Toyota, all of Japan, assignors to Elmo Company, Limited, Nagoya, Japan

Filed Sept. 15, 1973, Ser. No. 289,328
Int. Cl. G03b *21/11, 23/12*
U.S. Cl. 353—26 **11 Claims**



1. In a projector adapted for selective reproduction of the image or images placed in a particular frame or series of frames on a strip of film, the improvement comprising:

means for transporting the film including means for engaging the film;

incremental Motion pulse operated motor means for driving said film transport means;

circuit means for controlling the operation of said motor means;

means for generating a binary coded comparison signal corresponding to a particular frame of the film;

means for generating a command signal indicative of a particular frame bearing a particular image to be reproduced;

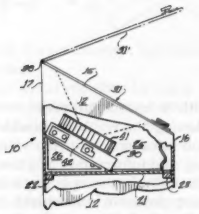
and comparison circuitry means for comparing said comparison signal with said command signal, and for forming a pulse operating signal for said motor means until coincidence of said two signals.

3,887,275

AUTOMATIC SLIDE MUSIC STAND

Kenneth D. Heist, 3118 Edmond, Billings, Mont. 59102

Filed July 1, 1974, Ser. No. 484,542
Int. Cl. G03b *21/10, 23/02*
U.S. Cl. 353—74 **2 Claims**



1. A music stand for use be musicians to display a musical score, the score being set forth on a sequential series of slides, the stand comprising:

a cabinet having a pair of supporting leg members extending from a top portion with the top portion being disposed at an upward incline slanting upwardly from the front to the back thereof with the top completely covering the cabinet top portion;

a compartment formed interiorly of the top portion of the cabinet and opening out of the top thereof;

means pivotally mounting the top to the cabinet to provide selective access to the compartment;

a viewing screen defined in said top and having a front surface exterior of the top and back disposed toward said compartment;

a slide projector mounted in said compartment and having a controllable slide-changing means associated therewith to operate the means in forward or reverse direction;

a light source associated with the projector to project the slide image onto the back surface of the viewing screen;

manually operable means for selectively varying the intensity of the light source;

a control switch for selectively energizing and de-energizing the projector and light source;

first electro-mechanical control means for operating the slide-changing means in a forward direction, the first control means having a manually adjustable timer operatively associated therewith, the timer adapted to be preset to any desired time interval for operation of the first control means to automatically sequence the slides, the time interval being selectable by the user;

second electro-mechanical control means for operating the slide-changing means in a reverse direction;

a control panel mounted on the top member and having the panel control switch, brighteners control, and adjustable timer mounted thereon for ease of access and use; and

foot operated means for selectively energizing either the first or second control means for operating the slide-changing means in forward or reverse direction for sequential slide selection and projection, the foot operated means including a flat rectangularly shaped bottom member operatively associated with a similarly shaped top member, a rocker element disposed intermediate to top and bottom members between the opposite ends thereof to define a rocking support for the top relative to the bottom, a first switch disposed adjacent to one end of the bottom member and operated by contact with the adjacent end of the top member, a second switch disposed adjacent the opposite end of the bottom member and operated by contact with the adjacent end of the top member, the first switch being electrically connected to the first control means and the second switch being electrically connected to the second control means whereby the user may select the mode of operation by a rocking movement of the foot on the foot operated means to selectively energize either the first or second switch.

3,887,276

RAPIDLY ACCESSIBLE OPTICALLY STORED INFORMATION

Burton Ross Clay, Wayland, and Douglas Alan Gore, Bedford, both of Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 134,383, April 15, 1971, abandoned. This application Oct. 18, 1972, Ser. No. 298,706
Int. Cl. G02b *27/00*
U.S. Cl. 353—26 **1 Claim**

1. An optical information retrieval system comprising: a film having a series of frames which has recorded at each frame

thereof a first hologram of an information object,

and a second hologram of the Fraunhofer form over a majority of the area of said frame of a binary encoded index object said first hologram being recorded with a first reference beam and said second hologram being recorded with a second reference beam, said first and second reference beams each having a unique and different angle of incidence upon said film;

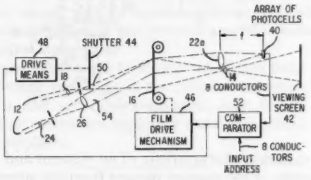
means for continuously driving said film;

means for applying first and second coherent light beams to the moving film at incident angles substantially identical

to the incident angles of said first and second reference beams respectively, so as to reconstruct an image of said information objects and of said binary encoded index objects;

a viewing screen and means for projecting said image of said information objects upon the viewing screen;

an array of light sensing elements disposed at the position of said image of said binary encoded index objects for detecting the binary code of said index objects during movement of said film and for producing a binary output



signal indicative thereof, the image of each said index object from a particular frame remaining stationary and superimposed over said array of light sensing elements during the entire time that any portion thereof is in the second coherent light beam; and

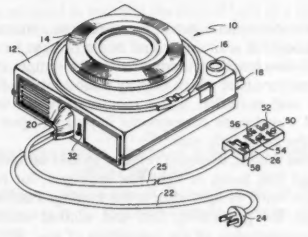
comparator means adapted to receive a binary address signal associated with a frame of recorded information object and connected to receive the array binary output signal, said comparator means having an output signal connected to said film driving means for stopping said film when the received signals correspond.

3,887,277

APPARATUS FOR REMOTELY CONTROLLING A SLIDE PROJECTOR

Charles William Tepper, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 14, 1974, Ser. No. 479,322
Int. Cl. G03b *23/00*
U.S. Cl. 353—103 **6 Claims**



1. In an improved control mechanism for remotely controlling an automatic slide projector having operatable means for applying an electrical signal of alternating polarity to said projector and a housing in which is included means energizable for effecting a particular predetermined projector control operation, and an electrical cable having at least one conductor interconnecting the housing and said control mechanism for selectively controlling said projector, said control mechanism compising:

a. switch means connected to said one conductor leading to said projector and movable into first and second positions; and

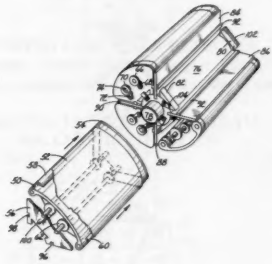
b. electrical circuit means operatively associated with said switch means, said electrical circuit means including means for defining a first circuit when said switch means is in said first position responsive to a particular polarity of the alternating electrical signal for actuating said operatable means to remove electrical power for said projector and means for defining a second circuit when said switch means is in said second position responsive to a polarity of the alternating signal opposite to said particular polarity for enabling said energizable means to be energized so that the predetermined projector control operation can be effected.

3,887,278

MULTI-SECTION DRUM ASSEMBLY

James Andrew Kolibas, Broadview Heights, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Dec. 3, 1973, Ser. No. 421,219
Int. Cl. G03g *5/10, 15/00*
U.S. Cl. 355—16 **7 Claims**



1. A photoconductor drum assembly for an electrophotographic reproduction apparatus, said assembly comprising;

a stationary support,

a rotary member mounted to said support for rotation about an axis,

a plurality of frame structures mounted to said rotary member, each frame structure including a support surface,

a photoconductor element carried by each of said plurality of frame structures, each photoconductor element comprising a web which extends between a supply location and a take-up location of the associated frame structure with an intermediate portion of the web engaging said support surface, and

releasable fastening means associated with each of said frame structures normally fastening such to said rotary member independently of the other frame structures and for selectively releasing such for movement relative to said rotary member independently of the other frame structures, said fastening means upon release permitting the associated frame structure to be displaced axially of said rotary member for convenient servicing or the like.

3,887,279

TRICOLOR ADDITIVE SYSTEM FOR A COLOR HEAD

Randolph D. Rubin, 301 W. Ohio, Midland, Tex. 79701

Filed Jan. 2, 1974, Ser. No. 429,574
Int. Cl. G03b *27/76*
U.S. Cl. 355—38 **18 Claims**

1. Method of making color prints from a color negative spaced between a lamphouse and an image producing lens wherein the lamphouse is optically coupled with an enlarger to provide a single source of component light comprised of a plurality of different primary colors, comprising the steps of:

supplying said component light with an electrically powered illuminating apparatus for each primary color;

selecting a color intensity for each of the different primary colors;

establishing an electrical reference signal for each primary color, with the magnitude of each said electrical reference signal being representative of the color intensity selected for a primary color;

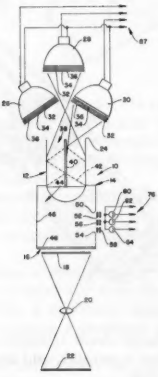
connecting the last said illuminating apparatus in series with a control means, so that electrical current flowing through the illuminating apparatus can be controlled;

controlling the color intensity of a color component of the component light in proportion to the magnitude of said electrical reference signal;

transmitting a sample of the component light through a filter means which establishes a light source for each different primary color;

measuring the intensity of the transmitted light for each different primary color;

providing an electrical intensity signal which is proportional to said measured intensity;



amplifying said electrical intensity signal, conditioning said amplified signal, and connecting the amplified signal to cause the average power applied to the illuminating apparatus to produce the desired light intensity measured for each different primary color;

electronically comparing the electrical intensity signal to said electrical reference signal;

changing said electrical reference signal to a value to cause said electrical intensity signal to attain the selected color intensity;

using a Triac as the control means, and connecting said amplified signal to said Triac by a programmable unijunction transistor by interposing a transformer between the transistor and the Triac and arranging the circuitry whereby a reduction in light intensity will result in triggering the Triac earlier in its cycle to thereby provide a higher power to the illuminating means.

3,887,280

ANALYTICAL APPARATUS AND METHOD OF ANALYSIS

William Ronald McLean, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

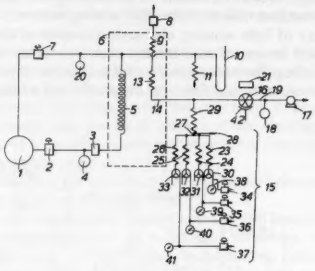
Continuation of Ser. No. 135,836, April 21, 1971, abandoned. This application Apr. 2, 1973, Ser. No. 346,911

Claims priority, application United Kingdom, Apr. 28, 1970, 20366/70; Apr. 27, 1970, 41246/70

Int. Cl. G01j *3/30*

U.S. Cl. 356—85 **20 Claims**

1. A method of analysis which comprises introducing a carbon-containing sample to a plasma in the presence of helium and a carbon lay-down suppressing amount of a scavenger for carbon, said scavenger being introduced separately before the sample is dissociated, resolving radiation emitted by the plasma according to its frequency, detecting the intensity of radiation characteristic of an element and determining the quantity of the element present from the intensity of radiation so detected.



3,887,281

SPECTROPHOTOMETRIC MEASUREMENT SYSTEM

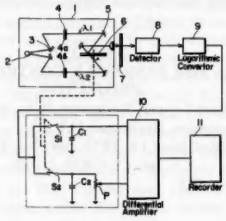
Takashi Kurita; Hiroshi Yamamoto, and Hideki Makabe, all of Kyoto, Japan, assignors to Shimadzu Seisakusho Ltd., Japan

Filed Mar. 31, 1971, Ser. No. 129,667

Claims priority, application Japan, Mar. 31, 1970, 45-27162

Int. Cl. G01j *3/42, 3/48;* **G01n** *21/22*

U.S. Cl. 356—96 **2 Claims**



1. A spectrophotometric measurement system comprising:

first means for scanning a first beam of light having first and second wavelength components over a sample of a material, the constituents of which occupy a substantially fixed position within said material, to be spectroanalyzed, said first and second wavelength components impinging upon said sample along the same light path;

second means, disposed relative to said sample upon which said first beam of light has impinged, for receiving said first beam of light after it has impinged upon said sample and for generating first and second electrical signals representative of the intensities of said first and second wavelength components, said second means comprising means for separating said first beam of light, after it has impinged upon said sample, into first and second portions, a first filter disposed in alignment with the direction of said first portion of the separated beam of light and adapted to pass a beam of said first wavelength therethrough, a second filter disposed in alignment with the direction of said second portion of the separated beam of light and adapted to pass a beam of said second wavelength therethrough, a first image receiving unit for receiving an image of the sample to be analyzed, said image being carried by said first separated beam portion, and a second image receiving unit adapted to receive an image

of the sample which is carried by said second separated beam portion;

third means, responsive to said first and second electrical signals generated by said second means, for producing a third signal representative of the ratio of said first and second signals, said third means including first and second amplifier means, respectively disposed to amplify the outputs of said first and second image receiving units, an arithmetic amplifier coupled to the output of said first amplifier means and a reference signal input, for comparing the output of said first amplifier means with said reference signal, to thereby control said first amplifier means in response to variations in the output of said first amplifier means, and for supplying the output from said arithmetic amplifier to said second amplifier means as a gain control signal; and

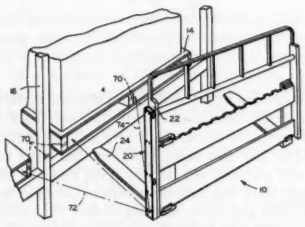
fourth means, responsive to the output of said third means, for recording variations in the ratio of the intensities of said first and second wavelengths, said fourth means comprising means for displaying the signal output of said second amplifier.

3,887,282

CONCAVE CONIC REFLECTOR

Howard C. Hansen, Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Feb. 22, 1974, Ser. No. 446,195
Int. Cl. G01b *11/26*
U.S. Cl. 356—138 **19 Claims**



1. In a collimated light generating device for referencing the position of load handling devices and the like, a light reflective element comprising a truncated portion of a substantially concave conical light reflective surface, said light reflective surface being adapted to redirect the rays of light of a substantially collimated beam which are directed onto the reflective surface from a predetermined location into a diverging plane of light substantially collimated in one dimension and adapted to appear as an intense line of light on an adjacent surface.

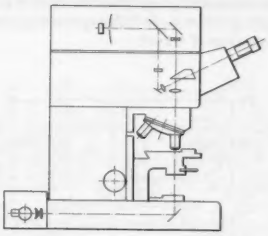
3,887,283

OPTICAL SYSTEM FOR A MICROSCOPE PHOTOMETRY ATTACHMENT

Kurt Merstallinger, and Klaus P. Schindl, both of Vienna, Austria, assignors to C. Reichert Optische Werke, AG, Vienna, Austria

Filed Apr. 1, 1974, Ser. No. 456,485
Claims priority, application Austria, Apr. 4, 1973, 2940/73
Int. Cl. G01j *1/42;* **G02b** *23/02*
U.S. Cl. 356—219 **5 Claims**

1. In a microscope having an objective, an inclined binocular eyepiece, and a beam deflector associated therewith aligned along an observation axis for viewing an object, the improvement comprising means to move said beam deflector out of the observation axis to provide an alternate observation axis, a positive reflective element aligned on said alternate observation axis, optical means to image said object on said positive reflecting element, said positive reflective element having an aperture axially located therein, means for performing photometric analysis located behind said aperture and permitting photometric evaluation of the corresponding portion of the object imaged on the positive reflecting element,



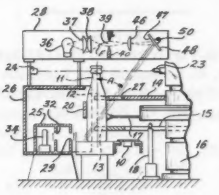
and reflecting means to deflect the object image reflected by the positive reflective element along said alternate observation axis to said eyepiece to provide the observer simultaneous viewing of said object and said aperture.

3,887,284

SCUFFED CONTAINER DETECTOR

James R. Gender, Kirkwood, and Siamac Faani, Ferguson, both of Mo., assignors to Barry-Wehmiller Company, St. Louis, Mo.

Filed Nov. 14, 1973, Ser. No. 415,615
Int. Cl. G01n *21/16, 21/32*
U.S. Cl. 356—240 **10 Claims**



10. Apparatus for detecting objectionable scuff conditions in the wall of transparent containers comprising means to move containers single file through a detection station, a source of light above said station oriented to direct light angularly downwardly toward the containers, said projected light being in the form of a narrow and well defined beam to pass through the container and illuminate the area normally scuffed, a light sensitive member spaced horizontally from and positioned at the opposite side of the station from said projected light beam, said member responding to a predetermined level of light to generate a container reject signal, and means between the containers moved through the station and said light sensitive member to limit the field of view by said light sensitive member to the illuminated area of the containers where scuffing normally occurs, said light sensitive member generating a reject signal for any container having an objectionable scuffed condition causing a diffused light emitting area to generate a light brightness response equal at least to said predetermined level of light.

3,887,285

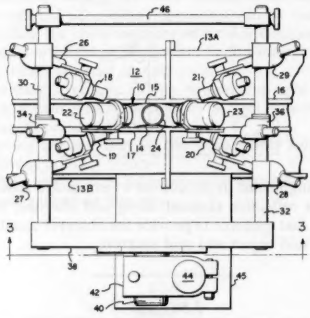
FLASK INSPECTION

William L. Fry, Lafayette, and Stanislav A. Sacha, Oakland, both, Calif., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 28, 1974, Ser. No. 446,662
Int. Cl. G01n *21/16, 21/32*
U.S. Cl. 356—240 **8 Claims**

1. Apparatus for inspecting glass containers, said glass containers having an elongated neck portion which merges with

a shoulder portion and a generally elliptical main body cross section with an elongated longitudinal dimension with respect to the transverse dimension, which comprises, in combination: means for transporting said glass containers in single file and in an upright position to and through an inspection zone along a fixed centerline of travel;



means, positioned in said inspection zone, for illuminating the junction of said neck and shoulder portions along the transverse dimension only of said glass containers;

light responsive means for sensing reflection from defects occurring at said illuminated junction; and

signal generating means for generating a signal in response to reflection sensed by said light responsive means.

3,887,286

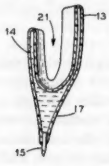
FINGER-TIP WRITING INSTRUMENT

Jackson P. Bucey, 41 Schoefield Rd., Rochester, N.Y. 14617

Filed Feb. 4, 1974, Ser. No. 439,294

Int. Cl. B43b *7/00*

U.S. Cl. 401—7 **8 Claims**



1. In a finger-tip writing instrument comprising an elongated body portion adapted to fit on the end of a finger through one end and provided with writing means at the other end, said body portion including a hollow portion wherein a supply of ink is stored, said ink supply being in communication with said writing means, the improvement wherein said body portion is formed of a material adapted to flex in use, and wherein said body portion consists at least in part of opposed longitudinal members, said opposed members forming channels comprising a longer upper member arced to encompass the top side of said finger and an opposed shorter lower member arced to encompass the lower side of said finger, said upper member being of such length as to cover the first joint of said finger.

3,887,287

MULTI-COLOR MARKING IMPLEMENT

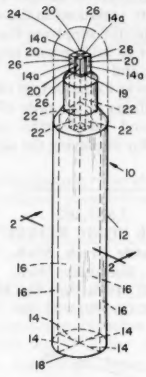
Dale M. Rosh, Jr., R.D. No. 1, Dallastown, Pa. 17313

Filed Feb. 28, 1974, Ser. No. 446,724

Int. Cl. B43k *27/08*

U.S. Cl. 401—35 **2 Claims**

1. A multi-color marking implement having an elongated tubular body closed at one end thereof and at the opposite end thereof a plurality of marking units comprising in combination, a cluster of elongated thin rib members extending longitudinally within said body and engaging each other at adjacent edges with the opposite edges thereof engaging the inner walls of said body to form a plurality of elongated integrally contained stationary ink retaining partition chambers, said ribs extending between the opposite interior ends of said body and outward therefrom at the marking unit end to form separation and support means for nibs, each of said separation and support means enclosing between the sides thereof at the marking unit of said body, a stationary nib formed from material adapted to absorb and respectively retain a different color ink with one end of said nibs being flush with the outer extremity of said ribs and portions of said ribs being exposed outwardly from said separation and support means of the marking end of said implement to provide a marking surface for each nib, and said chambers and nibs respectively being adapted to contain and feed inks of different colors therefrom for selective use of the same for marking purposes.



3,887,288

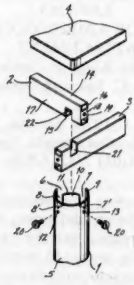
CORNER CONSTRUCTION

Harold Glaser, St. Louis, Mo., assignor to James Daivd, Inc., Maryland Heights, Mo.

Filed Jan. 8, 1974, Ser. No. 431,617

Int. Cl. F16d *3/00*; **F16g** *11/00*

U.S. Cl. 403—219 **15 Claims**



1. A corner construction for furniture and the like comprising a tubular upright having a side wall and a bore open at its normally upper end, a first frame bar, a second frame bar,

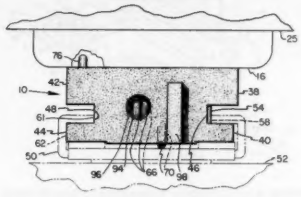
cooperative means provided on said first and second frame bars for interengaging same in an intersecting zone wherein the longitudinal axes of said bars are in perpendicular relationship, said intersecting zone being spaced from the adjacent ends of said bars, the said adjacent end of each bar abutting against the inner face of the upright side wall, and means fixedly engaging each of said bars at their said adjacent ends to the upright side wall with the points of engagement being spaced apart through an angle of approximately 90°.

3,887,289

FRICTION FOOT ATTACHMENT

David C. Smart, Westminster, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 20, 1973, Ser. No. 399,200
Int. Cl. A44b *17/00*
U.S. Cl. 403—315 **1 Claim**



1. A foot means of I-shaped configuration for attachment to a mounting shoe of photographic equipment wherein said shoe is of a C-shaped configuration and is manufactured to any one of a number of different tolerances, comprising a hollow body constructed of high friction material, said body having a hollow portion within the vertical portion of said foot means, said hollow portion being formed by two opposite internal walls whose outer surfaces are walls engageable by said shoe, a bow shaped leaf spring retained in a compressed position within said hollow portion of said body to continuously apply a biasing force in an outward direction between and against said two opposite internal side walls of said body, one of said side walls that forms a vertical portion of said I-shaped hollow body having an opening extending therethrough, the other of said side walls being compressible said bow shaped leaf spring having a portion thereof extending through said opening, said portion of said leaf spring being positioned for compression into said body by a first open end of any selected one of said C-shaped shoes as said body is mounted thereon and to thereby effect a transmission of a force through the remaining part of said leaf spring and outward joint movement thereof with the side wall of said body opposite said wall having said opening thereby to effect a squeezing of said last-mentioned side wall into a firmly mounted frictional engagement against a second open end of said selected shoe, whereby firm attachment of said foot means to any selected one of said shoes is effected notwithstanding that said shoes are not within the same manufacturing tolerance.

3,887,290

SHAFT CONNECTING APPARATUS

Charles F. Taylor, Boulder, Colo., assignor to Borg-Warner Corporation, Chicago, Ill.

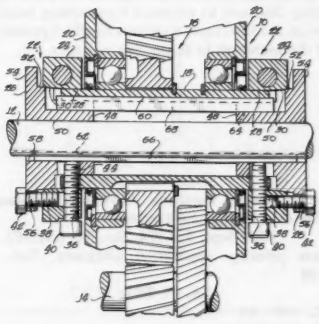
Filed Aug. 9, 1974, Ser. No. 496,428
Int. Cl. F16n *1/20*
U.S. Cl. 403—370 **14 Claims**

1. Apparatus for connecting and locking a first shaft to a second shaft of larger diameter comprising;

a split grip ring having its internal bore to receive said first shaft and having an external tapered shoulder portion;

a split reinforcing ring having a portion of its internal bore substantially complimentary to said tapered portion of said grip ring and which engages said portion of said grip ring, so that when drawn toward each other said grip ring shrinks to grip said first shaft;

said reinforcing ring also having a portion of its internal bore engaging said second shaft;



means to radially clamp said reinforcing ring to said second shaft and to said grip ring; and

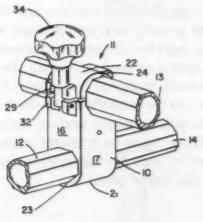
means to axially draw said grip ring toward said reinforcing ring to thereby shrink and grip said first shaft.

3,887,291

CLAMP JOINT FOR SEPARATED MEMBERS

Robert J. Langren, Alameda, Calif., assignor to Hosmer/Dorrance Corporation, Campbell, Calif.

Filed June 10, 1974, Ser. No. 478,056
Int. Cl. F16b *2/06*
U.S. Cl. 403—391 **3 Claims**



1. A frame joint for joining two structural members, comprising:

a housing having first and second passages extending therethrough, each slidably receiving one of the structural members;

a first pin disposed within said housing between said first and second passages and impinging at either end on the structural members, said first pin including a hole extending diametrically therethrough, and a second pin extending through said hole and anchored at both ends thereof in said housing;

securance means joined to said first passage for releasably retaining the structural member therein and for increas-

ing the impingement of said first pin on both structural members;

said securance means including a cover hingeably secured to said housing and forming a portion of said first passage, and tightening means for securing said cover to said housing and driving the structural member within said first passage to impinge on said first pin, said first pin being disposed in pressure transmitting relationship between the structural members to effect pressure clamping of the members in respective passages.

3,887,292

SPANNING JOINTS

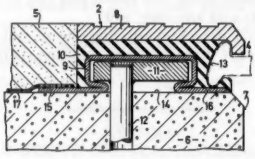
Waldemar Koster, Forsbach, Germany, assignor to Firma Korber-AG, Glarus, Switzerland

Filed Sept. 3, 1974, Ser. No. 501,951

Claims priority, application Germany, Nov. 15, 1973, 2357108

Int. Cl. E01c *11/02*

U.S. Cl. 404—69 **8 Claims**



1. In a device for spanning expansion joints in roads, comprising: marginal bodies of metal and elastomeric material anchored in the joint margins in an opposed arrangement and disposed adjoining the road surface and the joint, said bodies having a lateral groove with an aperture which is open in the direction of the joint for the sealing accomadation of members of an elastic expansion body covering the joint, the improvement in which each marginal body comprises an intermediate layer of rubber, on the underside of which is a metal mounting anchored in the joint margin; and on the upper surface of the intermediate layer there is a metal plate, the groove being defined at least in part by the intermediate layer, the metal mounting and the metal plate.

3,887,293

METHOD FOR IMPRINTING NON-REPEATING STONE PATTERNS IN FRESH CONCRETE

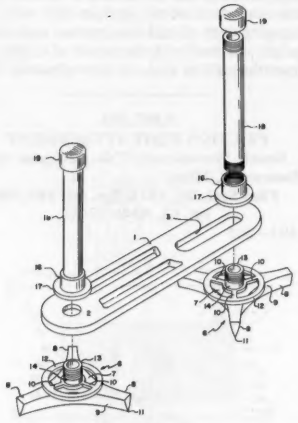
Bradshaw Bowman, Carmel, Calif., assignor to Bomanite Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 288,672, Sept. 13, 1972, Pat. No. 3,807,888. This application Apr. 9, 1974, Ser. No. 459,266

Int. Cl. E01c *19/00*

U.S. Cl. 404—72 **3 Claims**

1. A method for imprinting non-repeating stone patterns in fresh concrete comprising the steps of forming a concrete slab on the ground, imprinting a series of generally star shaped impressions in the fresh concrete to form a corner imprint in the stone pattern, interconnecting the corner imprints by



impressing a groove into the fresh concrete between the end portions of adjacent star shaped impressions.

3,887,294

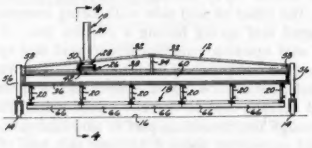
CONCRETE IMPRINTING APPARATUS AND METHOD

John E. Leon, 10165 Swallow Ave., Fountain Valley, Calif. 92708

Filed Nov. 15, 1973, Ser. No. 416,008

Int. Cl. E01c *23/02*

U.S. Cl. 404—89 **11 Claims**



1. A concrete imprinting apparatus comprising:

a frame including means operative to position said frame over a slab of partially set concrete;

imprinting tool means, including a plurality of interengaged tool segments located in adjacent relation and movable relative to one another to conform to the contour of a non-planar slab of concrete, said tool segments each including upwardly projecting impact sections;

a plurality of pressing means carried by said frame and actuable upon said plurality of tool segments, respectively, at points other than said impact sections to urge said tool segments into pressing engagement with said concrete;

an impactor;

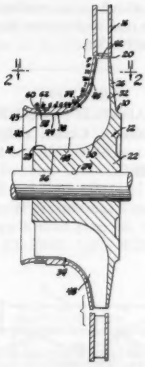
impactor raising means supporting said impactor and actuable to release said impactor to fall under the force of gravity for striking said impact sections of said tool means; and

locating means carried by said frame and operative to adjust the position of said impactor relative to said tool means.

3,887,295
COMPRESSOR INLET CONTROL RING

Mason Kwok Yu, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 3, 1973, Ser. No. 421,033
Int. Cl. F04d 31/00
U.S. Cl. 415—116 2 Claims



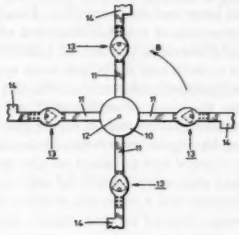
1. A centrifugal compressor comprising a stationary shroud with an inner wall having an axial inlet and a radial outlet, a continuously open inwardly converging inlet lip on said shroud fixedly connected with respect to said axial inlet to form a flow transition therebetween, a rotor including a hub adapted to be connected to a drive shaft, said hub including a hub wall having an axial inlet and a radial outlet a plurality of rotor blades supported on said hub wall including a radially outer tip and an axial leading edge and a radial trailing edge thereon, each of said rotor blades defining a flow passage therebetween bound by the inner wall of said stationary shroud and the hub wall and having a flow discontinuity negative pressure region at said tip from the axial leading edge through a part of the chamber length of said tip, a gap in the inner wall of said stationary shroud located circumferentially therearound at the flow transition between said inlet lip and said axial inlet, said gap being in communication with atmospheric pressure exteriorly of said stationary shroud and overlying the rotor blade tips immediately downstream of the leading edge of each of said rotor blades, an annular control ring movable with respect to said gap for regulating the communication between atmosphere and the inner wall of said stationary shroud to produce a controlled bleed of atmosphere to said negative pressure region to produce a uniform pressure and velocity gradient from the inlet to the outlet of each of the said flow passages with the total pressure and indicated air angle of compressed flow through the passages being uniform from the radial outlet of the shroud inner wall to the hub wall.

3,887,296
VIBRATION ABSORBING SYSTEMS

Noel Mills, Yeovil; David Ernest Hall Balmford, Sherborne, and James Edwin Saunders, Bradford Abbas near Sherborne, all of England, assignors to Westland Aircraft Limited, Yeovil, England

Filed Oct. 23, 1973, Ser. No. 408,748
Claims priority, application United Kingdom, Nov. 6, 1972, 51088/72
Int. Cl. B64c 27/32
U.S. Cl. 416—145 4 Claims

1. In a rotary wing aircraft having a main rotor system including a rotor hub and a plurality of rotor blades extending radially therefrom, a vibration absorbing system including at least three vibration absorbers mounted symmetrically about a generally vertical axis of rotation of the rotor system for rotation in a plane generally perpendicular to the rotational axis, each vibration absorber including a housing having an aperture formed therein which extends in a direction generally parallel with the axis of rotation, the aperture being defined in part by an outboard hollowed surface disposed with the concave portion thereof facing the axis of rotation, a spherical ball retained in the aperture so that during rotation of the rotor system the ball is retained in contact with the hollowed

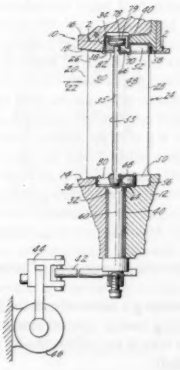


surface by centrifugal force, said hollowed surface having a first radius in a first plane generally perpendicular to the plane of rotation so that during operation the absorber cancels or reduces a vibration force of a particular frequency in said first plane, and a second and different radius in a second plane generally coincident or parallel with the plane of rotation so that during operation the absorber simultaneously cancels or reduces a vibration force of a different frequency in said second plane.

3,887,297
VARIABLE LEADING EDGE STATOR VANE ASSEMBLY

Michael John Welchek, Meriden, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed June 25, 1974, Ser. No. 482,955
Int. Cl. F01d 17/12
U.S. Cl. 415—161 5 Claims



1. A variable stator vane assembly for turbomachinery comprising:

casing means including inner annular casing means having inner surface means and outer annular casing means having outer surface means, said inner and outer surface means defining an annular gas flow path therebetween;

a plurality of stator vanes circumferentially spaced within said flow path, each including a radially extending airfoil,

said airfoil including a downstream stationary portion extending from said inner to said outer casing means and an upstream movable portion extending from said inner to said outer casing means, said movable portion including a continuous downstream edge, each of said stator vanes also including an inner spindle and an outer spindle, said inner and outer surface means each including openings therein for accommodating said spindles, said spindles being rotatably disposed therein, each spindle including a circular surface extending across said opening, said inner and outer spindles of each vane also having a common axis of rotation rearward of said downstream edge, said movable portion of said airfoil being fixedly secured to both said inner and outer spindles for rotation therewith, said circular surfaces having a diameter larger than the thickness of said airfoil and overhanging said downstream end of said movable portion, each of said spindles having a cavity therein open at said circular surface thereof and centered on said spindle axis of rotation, said stationary portion of said airfoil having a forward portion and a rearward portion, said rearward portion being secured to said casing means, said forward portion including pin means extending into said cavities of both said inner and outer spindles, said pin means having an axis common to said spindle axis of rotation; and

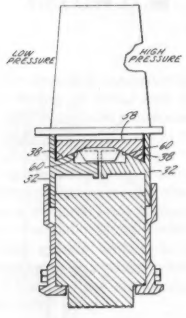
actuation means connected to said stator vanes for rotating said movable portions thereof.

3,887,298

APPARATUS FOR SEALING TURBINE BLADE DAMPER CAVITIES

John R. Hess, Middletown, and Joseph R. Kozlin, West Hartford, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed May 30, 1974, Ser. No. 474,756
Int. Cl. F01d *5/26*
U.S. Cl. 416—220 **7 Claims**



1. In a gas turbine having an axis of rotation, a wheel assembly comprising:

a turbine disk having a circumferentially extending rim with root connecting means spaced along the rim and first and second faces which are substantially perpendicular to the axis of rotation;

a plurality of turbine blades extending radially from the disk, each blade having a root which engages the root connecting means and a platform spaced apart radially from the root by a neck extension;

a plurality of seal plates, each of which abuts the first face of the disk at the rim and the neck extensions of two adjacent turbine blades and has a support section extending between the neck extensions of the adjacent blades; a plurality of vibration dampers each of which is located between the neck extensions of two adjacent blades in a position radially outward from the support of the seal plate, and has a sloped surface facing, and in contact with, the support section of the seal plate which is urged against the first face of the disk by axial components of centrifugal loads during rotation of the wheel assembly; a first sideplate which is in surface contact with the first face of the disk and covers the root portions of a plurality of turbine blades; and

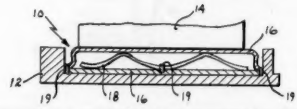
a second sideplate which is in surface contact with the second face of the disk and covers the root portions of a plurality of turbine blades.

3,887,299

NON-ABRADABLE TURBINE SEAL

Daniel Profant, Glastonbury, Conn., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 28, 1973, Ser. No. 392,381
Int. Cl. F01d *11/08*
U.S. Cl. 415—174 **3 Claims**



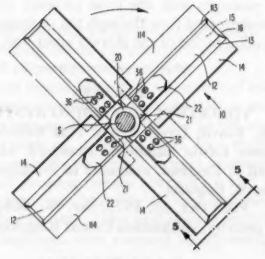
1. In a turbine engine comprising a rotating blade member and a surrounding fixed shroud wherein said improvement comprises a non-abradable seal having an outer housing located within and fixed to said shroud, said outer housing being made of an easily deformable foil material and a thin deformable foil material of sine-wave configuration being located within said outer housing with the peaks and depressions of the sine-wave being directed axially and facing the rotating blade member; thereby allowing for the lateral displacement of said seal under the action of said rotating blade member.

3,887,300

MIXER IMPELLER

Jerome B. Quinn, Kennett Square, Pa., assignor to Philadelphia Gear Corporation, King of Prussia, Pa.

Continuation-in-part of Ser. No. 359,421, May 11, 1973. This application Apr. 11, 1974, Ser. No. 460,105
Int. Cl. B01f *7/24*
U.S. Cl. 416—210 **18 Claims**



1. In combination:

a. an impeller shaft having an axis of rotation;

b. bracket arms secured to said shaft and extending radially outwardly therefrom;

c. impeller blades attached to said bracket arms, said impeller blades comprising:

c-1. a hat section having a crown, opposite brim portions, and side walls inter-connecting said crown and opposite brim portions and forming a hat-section cavity;

c-2. a flat cover plate secured to opposite brim portions and extending across said hat-section cavity and forming, with said brim portions, a forward flat face for said impeller blade;

d. and means connecting the radially-inward end portion of said impeller blade to said bracket arms in such disposition that the forward flat face of said impeller blade is inclined relative to the plane of the rotational axis of said impeller shaft.

3,887,301

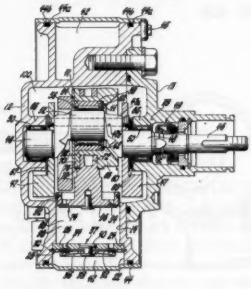
RADIAL COMPRESSOR HAVING IMPROVED PRESS-FIT PISTONS

Harry D. Henkel, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 416,932, Nov. 19, 1973, abandoned. This application June 28, 1974, Ser. No. 483,963

Int. Cl. F04b *1/04;* **B23p** *15/00*

U.S. Cl. 417—53 **9 Claims**



1. A radial compressor of the type including a cast cylinder housing having cross bores including cylinder walls therein along axes normal to each other, said housing having one closed end and a removable cylinder head closing its other end; a drive shaft rotatably mounted in said housing and said cylinder head, an eccentric on said drive shaft, a slider block rotatably mounted on said eccentric, a pair of yokes disposed normal to each other and having bearing surfaces in engagement with normal surfaces of said slider block, pairs of piston assemblies connected to each yoke so that the pistons extend oppositely from each other from said yokes, said piston assemblies being press-fit connected to said yokes providing a stable connection therebetween, said press-fit connection comprising an aluminum stem on each of said piston assemblies and an aluminum socket on its respective yoke, the diameter of said stem before the press-fit connection being larger than the diameter of said socket and one of said stem or said socket having a thin surface plating of soft metal having the characteristic to form a lubricant as the stem is pressed into the socket thereby to facilitate the press-fit connection, said pistons including a piston-skirt having a sealing ring disposed around the skirt providing a bearing surface between said piston skirt and the cylinder walls of said cross bores, the bearing surface of said sealing ring being sufficiently wide to accomplish a fluid tight seal while providing substantial area of engagement preventing metal-to-metal contact between said piston skirts and said cylinder walls, and valve means to direct fluids to and from the cross bores.

5. A method of press-fitting an aluminum compressor piston to an aluminum compressor yoke to form a stable connection suitable for reciprocation at high speeds along an axis and subject to concurrent lateral cocking forces of like frequency and comprising the steps of forming a socket on the aluminum yoke, forming a stem on the aluminum piston with an interference dimension with respect to the socket, immersion plating one of said stem and said socket in a sodium stannate chemical immersion plating solution to a tin thickness of substantially at least 0.00004 inch; and pressing said stem into said socket wihtout galling either said stem or said socket while controlling the press of said stem with respect to said yoke to an amount at which the final inertial load between said stem and said yoke will not cause deformation of said socket, thereby to form said stable connection.

3,887,302

TORQUE RESPONSIVE REGULATING APPARATUS FOR A PUMP

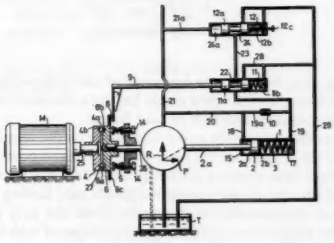
Wilhelm Appel, Lohr, Main, Germany, assignor to G. L. Rexroth GmbH, Lohr, Main, Germany

Filed Aug. 4, 1972, Ser. No. 277,929

Claims priority, application Germany, Aug. 6, 1971, 2139362

Int. Cl. F04b *49/00*

U.S. Cl. 417—212 **8 Claims**



1. Torque responsive regulating apparatus comprising a pump having an input means, a high pressure fluid inlet, and a low pressure reservoir; a drive motor having an output means; torque responsive means having a normal position and an actuated position, and moving to said actuated position when the torque transmitted from said motor to said pump exceeds a predetermined torque; regulating operating means for varying the volume displaced by said pump and including a hydraulic operating motor having an operating piston and an operating cylinder; control means operated by said torque responsive means in said actuated position to actuate said regulating operating means to reduce the volume displaced by said pump, said control means including a control valve and a control slide operated by said torque responsive means to control the flow of fluid in said hydraulic operating motor; a hydraulic circuit including conduits for connecting said pressure fluid outlet and said reservoir with said operating cylinder of said hydraulic operating motor and with said valve cylinder of said control valve; and pressure responsive means responsive to the pressure of the pump and connected with said control valve to operate the same to actuate said regulating operating means when the pressure in said pump exceeds a predetermined pressure.

3,887,303

HERMETICALLY SEALED MOTOR COMPRESSOR

Takashi Matsuzaka; Tsuneo Koga, both of Fuji, and Kazuya Komiyama, Kamakura, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Jan. 19, 1971, Ser. No. 107,681

Claims priority, application Japan, Oct. 9, 1970, 45-100176

Int. Cl. F04b *17/00;* **F16f** *15/00*

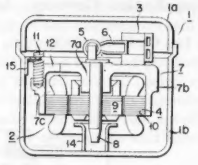
U.S. Cl. 417—363 **6 Claims**

1. A hermetically sealed motor compressor including:

a hermetically sealed casing;

a compressor body housed in said casing and comprising a generally cup-shaped frame having a generally circular rim extending downward therefrom, said frame being provided at the upper portion thereof with a plurality of substantially equally spaced notches for causing the interior of said frame to communicate with the outside thereof, the bottom of each of said notches constituting the horizontally flat upper surface of said rim;

a plurality of generally L-shaped one piece spring hangers equal in number to the number of said notches, each spring hanger comprising a fitting portion fixed to said casing and an arm portion extending inwardly of said casing from said fitting portion, said spring hangers being disposed in said casing at a substantially equal peripheral



spacing and with the free ends of said arm portions jointly defining an inscribed circle having a diameter larger than the outside diameter of said frame;

a plurality of springs equal in number to the number of said notches, each spring having the lower end portion thereof fitted into a spring socket provided on the upper surface of the rim at the respective notch, and having the upper end portion thereof connected with the arm portion of the respective spring hanger by means of said free end of said arm portion being inserted between two adjacent coils of the upper end portion of the respective spring; and

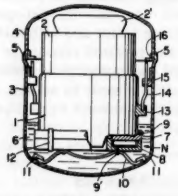
a substantially semicircular spring-engaging groove provided on at least one of the upper and lower surfaces of the arm portion of said spring hangers to receive one of the coils of its respective spring.

3,887,304

COMPRESSOR CONSTRUCTION

Takashi Otaki, Okazaki, and Yoshiaki Aihara, Nagoya, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Sept. 20, 1973, Ser. No. 399,046
Claims priority, application Japan, Oct. 25, 1972, 47-10619
Int. Cl. F04b *17/00*
U.S. Cl. 417—363 **6 Claims**



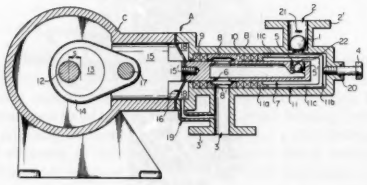
1. A compressor construction comprising a closed casing, a motor compressor body arranged within said casing and having a rotor rotatable about an axis of rotation, spring means for supporting said motor compressor body in said casing at a location spaced from the interior of said casing, a damping liquid comprising a lubricating oil contained in the lower portion of said casing, and damper stopper means connected to said compressor body and including first and second stopper elements, said first stopper element being secured to said compressor body, said second stopper element being supported below said first stopper element within said housing, each of said first and second stopper elements having radially extending blades, the blades of said first stopper member being interengaged between the blades of the second stopper member, the blades of said second stopper member defining chambers therebetween with escape openings for the passage of the damping liquid during the relative movement of said stopper members and the blades thereof and a support spring supporting said second stopper element and mounted in said housing in the damping liquid and being connected to said second and said housing in a manner to prevent rotation of said second element but to permit some vertical movement thereof.

3,887,305

RECIPROCATING PUMP

Kazuichi Ito, No. 1463-4, Ichibu-cho, Ikoma-shi, Nara-ken, Japan

Filed Apr. 17, 1973, Ser. No. 351,825
Claims priority, application Japan, July 18, 1972, 47-310
Int. Cl. F04b *49/00*
U.S. Cl. 417—439 **2 Claims**



1. In a reciprocating pump, the combination of

1. a cylindrical casing having two closed ends,
2. a liquid discharge conduit near one end of the cylindrical casing,
   a. a check valve being mounted in the discharge conduit,
3. a liquid inlet conduit near the outer end of the cylindrical casing,
4. a partition means dividing the cylindrical casing into a suction chamber adjacent the other end and a discharge chamber adjacent the one end,
   a. the partition means including a lantern ring having a bore communicating with the inlet conduit and gland packings adjacent the lantern ring and providing a seal between the lantern ring and the suction and discharge chambers, respectively,
5. a flexible sealing member closing the other end of the cylindrical casing, the sealing member and the partition means defining the suction chamber therebetween,
6. a housing having an open end in alignment with the other end of the cylindrical casing,
   a. the flexible sealing member being held between the open end of the housing and the other end of the cylindrical casing,
7. a tubular plunger defining an axial bore reciprocably received in the cylindrical casing in an axial passage of the lantern ring, the tubular plunger having two ends and one of the plunger ends being connected to the flexible sealing member,
   a. an inlet port being arranged in the plunger adjacent the one end thereof and communicating with the axial bore,
   b. an outlet port being arranged in the plunger adjacent the outer end thereof and communicating with the axial bore, and

c. a check valve being mounted in the outlet port,

8. a drive means mounted in the housing and connected to the one end of the tubular plunger for reciprocating the plunger in the cylindrical casing between positions wherein the inlet port is in and out of register with the inlet conduit, and

9. a conduit interconnecting the suction chamber and the liquid inlet conduit.

3,887,306

PERISTALTIC PUMP AND HOSE THEREFOR

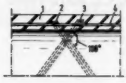
Jan Willem Gerritsen, Raadhuisstraat 75 a,, Alphen a/d Rijn, Netherlands

Filed Jan. 29, 1974, Ser. No. 437,702

Claims priority, application Netherlands, Jan. 31, 1973, 7301380

Int. Cl. F04b *43/18, 43/12, 45/06*

U.S. Cl. 417—477 **8 Claims**



1. A peristaltic pump comprising a plurality of thrust rollers mounted for rotation and movable in a circular orbit around a central shaft, an arcuate support track concentrically around part of said orbit, and a hose of uniform thickness reinforced with threads of strong material, such as steel, said hose being arranged to be locally squeezed shut by said thrust rollers against said support track, characterized in that reinforcing threads extending in the longitudinal direction of the hose are embedded exclusively in two wall zones of said hose, said wall zones, as viewed in the cross-section of the hose, being located in a relatively small sector and symmetrically on opposite sides of a diameter perpendicular to said central shaft.

3,887,307

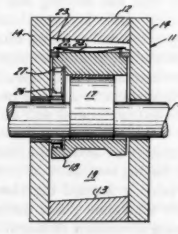
ROTARY MECHANISM WITH DIE-CAST TROCHOIDAL HOUSING

Winthrop B. Pratt, North Haledon, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Apr. 30, 1974, Ser. No. 465,477

Int. Cl. F01c *1/02*

U.S. Cl. 418—61 A **7 Claims**



1. A rotary mechanism having a housing comprising a peripheral shell having a generally trochoidal inner surface and a pair of side walls defining therein a rotor cavity, a shaft journaled by the side walls coaxially with the peripheral shell and having an eccentric portion within the rotor cavity, a rotor of generally polygonal profile having a plurality of apex portions and rotatably mounted on the shaft eccentric portion, the rotor apex portions sweeping the inner trochoidal surface in sealing relation thereto, wherein the improvement comprises:

a. the peripheral shell being a die-cast member, the inner trochoidal surface thereof being tapered in the axial direction from the side adjacent one side wall to the side adjacent the opposite side wall, the amount of taper being from about ½° to about 1½° and

b. the rotor having at each apex portion sealing means sweeping the inner trochoidal surface of the peripheral shell, the sealing means comprising a slot having radial depth and axial extent in each rotor apex portion, and a sealing strip disposed in each slot with the radially outer edge of the sealing strip parallel to the tapered inner trochoidal surface and resiliently urged into sealing contact therewith.

3,887,308

VALVE PORTING ARRANGEMENT FOR A GEROTOR

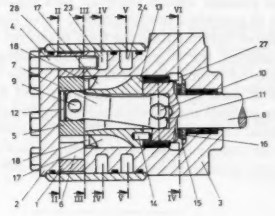
Karl-Heinz Liebert, Schwabisch Gmund, Germany, assignor to Zahnradfabrik Friedrichshafen AG, Germany

Filed Apr. 30, 1973, Ser. No. 355,411

Claims priority, application Germany, Apr. 29, 1972, 2221183

Int. Cl. F01c *1/02;* **F03c** *3/00;* **F04c** *1/02*

U.S. Cl. 418—61 B **16 Claims**



1. In a fluid displacing device, a housing (3) having separate ports (24 and 25) and to which an internal gear (1) is fixed, an external gear (5) in mesh with the internal gear to form pressure chambers (6) within the internal gear, a power shaft (8) and articulated means (7) coupling the shaft to the external gear for imparting planetary movement thereto causing expansion and contraction of said pressure chambers, a fluid distributing system including a flow controlling member (13) mounted on the coupling means having a radially outer valve surface and an axial end surface in sliding contact with the external gear, means directly connecting the flow controlling member to the power shaft for rotation thereof at the same speed as the external gear to control flow of fluid at said valve surface to and from the ports and conduit means (17–18) mounted in the flow controlling member to form passages in continuous fluid communication with the pressure chambers and said valve surface of the flow controlling member for conducting said flow of fluid between said ports and said pressure chambers during rotation of the power shaft.

3,887,309

HIGH PRESSURE EXPANSIBLE CHAMBER DEVICE

Wayne B. Easton, 3001 W. 96th St. Cir., Bloomington, Minn. 55431

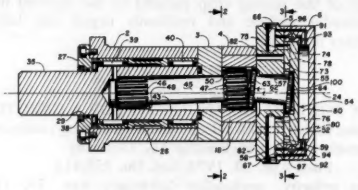
Filed Jan. 10, 1974, Ser. No. 432,196

Int. Cl. F01c *1/02;* **F03c** *3/00;* **F16k** *25/00*

U.S. Cl. 418—61 B **3 Claims**

1. A fluid pressure operated device of the expansible chamber type comprising a casing, expansible chamber means, a valve block having a fluid transfer surface, said valve block

having a plurality of expansible chamber feeding and exhausting passages having fluid communication with said expansible chamber means and having openings in said transfer surface, a valve having a surface engaging said transfer surface, said valve surface having recessed feeding and exhausting sections,reversible inlet and outlet passages in said valve block having openings in said transfer surface and respective constant fluid communication with said feeding and exhausting sections of said valve, said valve block inlet passage and said valve feeding section forming fluid inlet path means, said valve block outlet passage and said valve exhausting section forming fluid outlet path means, said valve being cyclically movable relative to said transfer surface with said feeding and exhausting sections thereof sequentially feeding and exhausting said

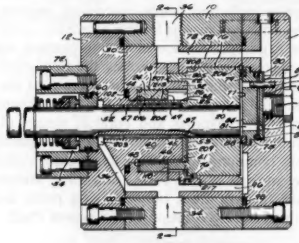


expansible chamber passages, said casing forming a valve biasing pressure chamber for said valve, first restrictor passage means between said inlet path and said chamber and second restrictor passage means between said outlet path and said chamber to provide a predetermined valve biasing pressure in said chamber intermediate the fluid pressures in said inlet and outlet passages, the magnitude of said biasing pressure being dependent on which one of said reversible inlet and outlet passages is used as an inlet passage, said first and second restrictor passage means each including at least two passages with at least one passage thereof being a one-way passage and at least one other passage thereof being a two-way passage and drive means between said expansible chamber means and said valve.

3,887,310
HYDRAULIC PUMP/MOTOR WITH HYDROSTATICALLY BALANCED ROTORS

Karol Gerber, 3336 E. Whittaker Ave., Cudahy, Wis. 53110

No Drawing. Filed July 2, 1973, Ser. No. 376,031
Int. Cl. F01c *1/10, 21/00;* F03c *3/00*
U.S. Cl. 418—72 12 Claims

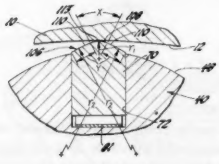


1. In a pump/motor unit having a housing with a rotor chamber, a liquid inlet at one side of the chamber and a liquid outlet at the other side of the chamber, said inlet and outlet providing for passage of liquid through said chamber, power and idler rotors in said chambers, said rotors having intedigitable teeth, bearings upon which said rotors turn, the improvement for hydraulically balancing hydrostatic pressure on the idler rotor and comprising pressure chamber means between the idler rotor and its bearing, said pressure chamber means comprising narrow grooves, the bearing surfaces between said grooves being wider than the grooves and defining hydraulic film spaces fed by said grooves and duct means from the rotor chamber to said grooves to conduct pressurized liquid to said pressure chamber means and counter-balance the hydrostatic pressure of said liquid on the idler rotor, said idler rotor having a cylindrical hub, said pressure chamber means comprising a plurality of such narrow grooves disposed radially in one axial end of said hub and running out at the inner surface of the hub and a like plurality of such narrow grooves extending axially along the inside of said hub and running out at the end of the hub and intercommunicating with said radial grooves.

3,887,311
ROTARY MACHINE APEX SEAL

Paul J. Louzecky, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 28, 1974, Ser. No. 455,564
Int. Cl. F01c *19/02*
U.S. Cl. 418—113 3 Claims



1. A rotary machine having an internal peripheral wall and oppositely facing side walls coooperatively defining a cavity, said peripheral wall defined by a curve that is parallel to and spaced outwardly a predetermined oversize dimension from a multi-lobed generated closed curve, a crankshaft having an eccentric in said cavity, a multi-lobe rotor rotatably mounted on said eccentric, said rotor having a plurality of apexes that remain adjacent said peripheral wall as said rotor and said crankshaft rotate, said rotor having peripheral faces extending between pairs of said apexes that cooperate with said cavity walls to define a plurality of working chambers that vary in volume and move with said rotor, an apex seal mounted at each said apex on said rotor having an outwardly facing convex sealing surface that has moving line contact with said peripheral wall as said rotor and said crankshaft rotate for sealingly separating adjacent working chambers, each said sealing surface symmetrical to a radial plane through the axis of said rotor and the associated rotor apex that determines an apex seal angle with respect to a plane perpendicular to the line of tangency to said peripheral wall at the line of sealing contact, said apex seal angle varying between ± a maximum apex seal angle as said rotor and said crankshaft rotate, each said sealing surface having two identical end portions contiguous with a center portion located therebetween, said center portion centered on the radial plane through the associated rotor apex and having a constant radius of curvature substantially equal to said oversize dimension, and said end portions located at identical angular locations either side of the radial plane through the associated rotor apex and tangent to said center portion and having constant radii of curvature substantially equal to the radius of curvature of said peripheral wall at said maximum apex seal angle.

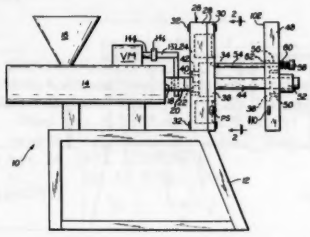
3,887,312
INJECTION MOLDING APPARATUS

Eugene G. Seary, 33 Alide Ave., Hillcrest Binghamton, N.Y. 13901

Continuation of Ser. No. 157,605, June 28, 1971, abandoned, which is a continuation of Ser. No. 822,655, May 7, 1969, abandoned. This application Nov. 21, 1972, Ser. No. 308,477

Int. Cl. B29f *1/03, 1/06*

U.S. Cl. 425—3 **10 Claims**



1. In an injection molding apparatus including a pair of platens relatively movable between closed and open positions for closing and opening a mold, means for moving said platens into and out of said two relative positions comprising:

a. an electro-magnetic winding embedded in one of said platens;

b. circuit means for energizing said winding with a magnetizing current in one direction for attracting said other platen thereto to close said platens;

c. means for biasing said platens to their open position; and

d. circuit means for energizing said winding with a current in the reverse direction of a value sufficient to reduce residual magnetism to a degree that said baising means can move said platens to said open position but below a value to reclose said platens.

3,887,313
VULCANIZING DEVICE FOR OPEN HOLLOW BODIES, ESPECIALLY TOROIDAL RAW PNEUMATIC TIRES

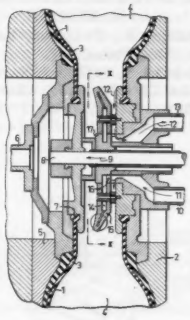
Roland Jaedicke, Hemmingen-Westerfeld, and Ulfert Schmidt, Hannover, both of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany

Filed Oct. 25, 1973, Ser. No. 409,581

Int. Cl. B29h *5/02*

U.S. Cl. 425—42 **7 Claims**

1. A curing device for open hollow bodies, especially toroidal raw pneumatic tires, which includes in combination: a mold, mold receiving means for receiving a mold for a hollow body to be cured, hollow heat carrying means movable selectively into and out of a hollow body inserted into the interior of the mold in said mold receiving means and adapted in its interior to receive and carry a heating substance, conveying means associated with said heat carrying means for conveying a heating substance into said heat carrying means when the latter is inserted into the hollow body to be cured, said conveying means including nozzle means forming the inner end of said conveying means, said nozzle means including housing means defining a chamber and provided with opening means communicating with the interior of said heat carrying means, tubular means having an inlet communicating with said chamber and having an outlet communicating with the interior of said heat carrying means, and a nozzle having an inlet communicating with said conveying means and having a mouth adjacent said inlet of said tubular means, whereby heating substance passing from said nozzle into said tubular means draws



heating substance from said chamber into said tubular means while intermixing with said last mentioned heating substance.

3,887,314
SYSTEM FOR THE PRODUCTION OF PRESSED BOARD

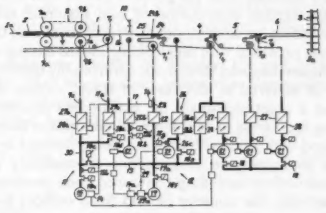
Egon Andresen, Nieder-Ramstadt; Wolfgang Reiners, Kapellen, Kr. Moers, and Alfons Klassen, Krefeld, all of Germany, assignors to G. Siempelkamp & Co., Krefeld, Germany

Filed June 29, 1973, Ser. No. 374,982

Claims priority, application Germany, June 29, 1972, 2231802; Sept. 9, 1972, 2244315

Int. Cl. B29j *5/08;* **B29d** *7/14*

U.S. Cl. 425—135 **12 Claims**



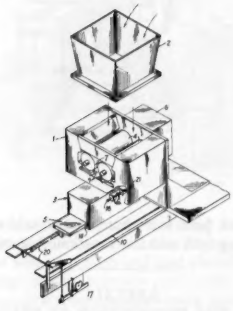
1. In an apparatus for the production of pressed board comprising a press having upper and lower press belts and transport conveyors for advancing a layer of compressible material into, through and beyond said press, said conveyors including a press-traversing belt, said press-traversing belt at least intermittently being synchronized with said press belts, the improvement which comprises a first drive operatively connected to said press belts for driving same, a second drive operatively connected to said conveyors and independent of said first drive, and further comprising means for mechanically synchronously coupling said drives for accelerating said belts to a normal operating speed for compression of said layer between said press belts, and for decoupling said drives upon attainment of said speed, said first drive including a motor, a device responsive to the torque at said press-traversing belt for producing a control signal upon decoupling of said drives by the last-mentioned means, and means responsive to said signal

for controlling said motor to maintain synchronism of said press-traversing and press belts.

3,887,315
APPARATUS FOR METERING AND SHAPING MATERIALS

Malcolm E. Phillips, Jr., Richmond, Va., assignor to AMF Incorporated, White Plains, N.Y.

Filed Oct. 5, 1973, Ser. No. 403,870
Int. Cl. A01j *17/00;* **A21c** *5/00*
U.S. Cl. 425—209 **6 Claims**



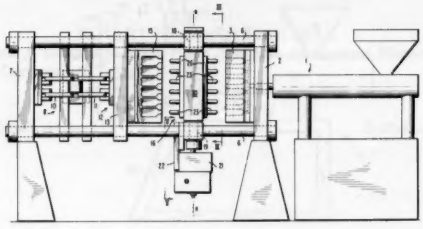
1. An apparatus for the production of discrete portions of material from a source of supply including: a first chamber provided with contra rotating roller means for introducing a stream of material to be divided; means for receiving such material and urging the forward movement of the material through a predefined area further downstream; a second chamber provided with a plurality of predefined channels for receiving material from the point of exit of said first chamber to enable further distribution of said material; said second chamber being juxtapositioned with respect to said first chamber, being provided with manifolding means having adjustable baffle means disposed therein for controllably distributing said stream of material in its course of travel; orifice means disposed at a point proximate the exit of said second chamber enabling the egress of said material and means cooperatively associated with said orifice means being defined by movable orifices conforming in cross-section substantially to that of said fixed orifices including contoured knife portions adapted to co-act with the contour of said fixed orifices for forming said discrete portions of material exiting from said orifice means.

3,887,316
APPARATUS FOR INJECTION-BLOW-MOLDING HOLLOW ARTICLES

Borge Hestehave, 8031 Beechwood Dr., Alta Loma, Calif. 91701

Filed Aug. 2, 1972, Ser. No. 277,274
Int. Cl. B29c *5/06*
U.S. Cl. 425—242 B **16 Claims**

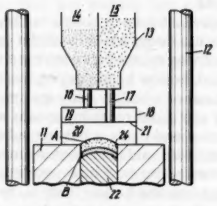
1. A machine for making articles of moldable material such as plastics and the like by sequentially injection molding a parison around a mandrel and blow molding the parison to form the finished hollow articles; said machine comprising: an injection molding station, a blow molding station, an intermediate station arranged between said injection molding station and said blow molding station and including an open space, mandrel means including at least one mandrel for forming a core support for a parison to be injection molded at the injection molding station, transfer means for transferring said mandrel and associated parison from said injection molding station to said blow molding station, clamping mold means arranged adjacent said mandrel and having a mold surface configuration corresponding to the final desired shape of a portion of the hollow article to be made, said clamping mold means being connected to said transfer means for movement with said mandrel from said injection molding station to said blow molding station, said clamping mold means including a plurality of parts forming a disengageable clamping connection with said portion of the hollow article for holding said parison on said mandrel during transfer from said injection molding station to said blow molding station, clamping means for normally maintaining said clamping mold means in clamping engagement with said parison throughout the transfer from the injection molding station to the blow molding station, and selectively actuable first disengaging means for selectively releasing said clamping mold means when said parison is at said intermediate station adjacent said open space to facilitate removal of said parison from said mandrel during shut down and start up of the machine, wherein said clamping mold means includes two parts, and wherein said clamping means includes spring means normally biasing said two parts toward one another, and wherein said first disengaging means includes a cam and toggle arrangement for moving said two parts away from one another against the action of the spring means.



3,887,317
PRESSING APPARATUS

Werner Plocher; Horb Ihlingen; Franz Kuhl, all of Herdecke, and Bernhard Hüttermann, Glinde, all of Germany, assignors to Jurid Werke GmbH, Glinde and Maschinenfabrik Lauffer & Butscher, Muhlen, both of, Germany

Filed June 3, 1974, Ser. No. 476,148
Claims priority, application Germany, June 6, 1973, 2328700
Int. Cl. B30b *11/02, 15/30*
U.S. Cl. 425—257 **8 Claims**



1. A pressing apparatus for transforming volumes of powder-like material into compacted bodies, comprising

a table,

a die chamber within said table and having a filling opening defined by parts of said table,

compacting means cooperating with said die chamber for compacting the contents thereof,

guideway means laterally spaced from said filling opening, a connecting portion on said table between said guideway means and said filling opening,

a plurality of charging frames, each frame defining a hollow space and having an open top for receiving powder-like material, and an open bottom for the discharge of said material,

first means for moving said frames along said guideway means,

second means for moving said frames out of said guideway means and along said connecting portion on top of said filling opening and back, and

means for closing said bottom opening outside of said filling opening.

3,887,318

CONTINUOUSLY OPERATING PRESS

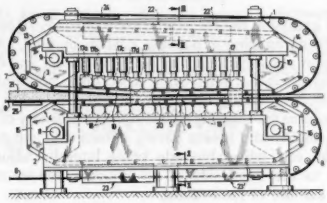
Albert DeMets, Kachtem, Izegem, Belgium, assignor to Bisonwerke Bahre & Greten GmbH & Co. Kg, Germany

Filed Mar. 8, 1973, Ser. No. 339,039

Claims priority, application Germany, Mar. 8, 1972, 2211191; Apr. 24, 1972, 2220074

Int. Cl. B29c *15/00*

U.S. Cl. 425—371 **26 Claims**



1. A press for producing boards such as chipboards, fibreboards, and the like; said press comprising:

a first movable endless belt formed of heatable belt parts,

a second movable endless belt formed of heatable belt parts, guiding and moving means for guiding and moving said first and second belts with respective outer surfaces of said belts in facing relationship and moving in the same direction over a material pressing portion of the respective travel paths of said belts such that material forming said boards can be conveyed by and compressed between said belts along said material pressing portion of said respective travel paths,

and heating means for heating at least one of said first and second belts, said heating means including at least one flame burner directing a heating flame against a portion of at least one of said belts and burner exhaust gas conducting means for directing exhaust gases from said at least one flame burner against portions of at least one of said belts which are spaced from said portion being directly heated by said heating flame.

3,887,319

APPARATUS FOR THE EXTRUSION OF ULTRA HIGH MOLECULAR WEIGHT POLYMERIC RESINS

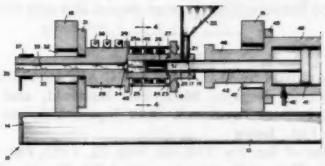
Robert A. Cottingham, York, Pa., assignor to The Polymer Corporation, Reading, Pa.

Filed Dec. 8, 1972, Ser. No. 313,233

Int. Cl. B29f *3/08*

U.S. Cl. 425—379 R **7 Claims**

1. Apparatus for the extrusion of a continuous length of ultra high molecular weight polyethylene, said apparatus including a precompression chamber; means for delivering successive charges of particulate ultra high molecular weight polyethylene to said precompression chamber; a preheating chamber connected to said precompression chamber in axial alignment therewith, the diameter of said preheating chamber being substantially identical to that of said precompression chamber; heating means for maintaining the temperature in said preheating chamber at predetermined level; an elongated die connected to said preheating chamber in axial alignment therewith, said die having an elongated passageway provided with a tapered inlet portion adjacent one end thereof and a discharge orifice adjacent the other end thereof extending therethrough, said tapered inlet portion increasing substantially in diameter from a profile complementary to that of said



elongated passageway to a size complementary to that of said preheating chamber; the transverse area relationship between the diameter of the preheating chamber and the profile of the elongated die passageway being on the order of 3:1 temperature control means extending substantially the entire length of said die for creating a predetermined maximum temperature at the die inlet for insuring the formation of a homogeneous mass and gradually reducing to a lower level as the extrusion exits from said discharge orifice; and reciprocable ram means mounted in axial alignment with said precompression chamber for successively compacting and advancing charges of particulate ultra high molecular weight polyethylene through said preheating chamber and into said die passageway.

3,887,320

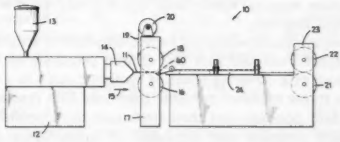
METHOD AND APPARATUS FOR CONTINUOUSLY FORMING PLASTIC SHEET AND CORRUGATING WITH VACUUM PRESSURE

Richard H. Erlewine; Charles W. Richter, III, and Arthur J. Calpha, Jr., all of Marion, Ind., assignors to General Plastics Corporation, Marion, Ind.

Filed Apr. 13, 1973, Ser. No. 350,727

Int. Cl. B29c *17/04*

U.S. Cl. 425—384 **5 Claims**



1. An apparatus for producing grooves in a sheet of plastic comprising:

a supporting bed for receiving said sheet including a heated portion and an adjacent cooled portion, said bed further including a top surface with a plurality of ridges and grooves formed on said top surface extending through the length of said cooled portion and at least partially through the length of said heated portion, said bed having holes extending through said top surface in said grooves to facilitate air removal;

heating means operable to controllably heat said heated portion to maintain said sheet in a soft condition;

cooling means operable to controllably cool said cooled portion for the cooling and hardening of said sheet;

air means operable to withdraw air through said holes in said bed creating a vacuum in said grooves of said bed between said sheet and said bed forcing said sheet into said grooves of said bed;

said bed including a pair of longitudinally extending edge portions with said ridges and grooves positioned therebetween, said edge portions having top surfaces with passages extending therethrough connected to said air means which is operable to withdraw air through said passages effecting an airtight seal between said edge portions and said sheet moving thereon and further comprising:

said edge portions each having a slot extending the length thereof; and

pressure means projecting into said slot with said sheet forced between said pressure means and said slot.

3,887,321

VACUUM SEALED MOLDING APPARATUS

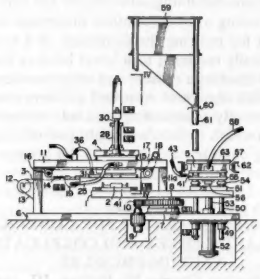
Itsuo Hijikata, Nagoya; Masayoshi Kasazaki, and Hideto Terada, both of Toyokawa, all of Japan, assignors to Sintokogio Ltd., Japan

Division of Ser. No. 334,708, Feb. 22, 1973, Pat. No. 3,843,301. This application Apr. 30, 1974, Ser. No. 465,568

Claims priority, application Japan, Feb. 23, 1972, 47-19154; Feb. 23, 1972, 47-19155

Int. Cl. B29c *17/04*

U.S. Cl. 425—388 **2 Claims**



1. A vacuum sealed molding apparatus comprising

means for transferring a pattern fixed on a pattern plate from a first position to a second position and then from said second position to said first position, said second position being apart from the first position and provided with means for supplying a charge of heat resisting particulate material into a flask which is conveyed to said second position;

covering sheet supplying means disposed at a third position apart from said first and second positions for holding a web of a covering sheet of synthetic resin in a roll form; a frame member movable from said first position to said third position and then from said third position to said first position and consisted of surrounding side walls forming an open end thereof and a vacuum chamber provided along the side walls having a slot to draw said covering sheet to said slot by vacuum suction, said frame member being operative to hold said covering sheet on the surface of said open end by said vacuum suction when it is moved to said third position and to pull out said sheet from said supplying means when being moved to said first position whereby said pulled out sheet is supplied at the third position so that said frame member moved again to the third position is adapted to hold said sheet;

means for causing vertical movement of said frame member holding said sheet or said pattern transferred to said first position relatively toward each other so as to apply said covering sheet on the surfaces of the pattern and the pattern plate and means disposed at the second position for causing vertical movement of said flask or said pattern relatively so as to set the flask on the pattern covered with the covering sheet and then remove said pattern from the flask after molding.

3,887,322

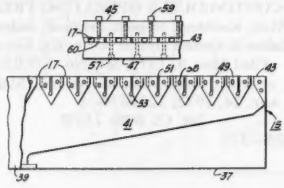
EXTRUDER DIE FOR MULTIPLE STREAM EXTRUSION

Keith G. Johnson, Pittsburgh, and Anthony Paul Limbach, Downingtown, both of Pa., assignors to Arco Polymers, Inc., Glenolden, Pa.

Filed Nov. 28, 1973, Ser. No. 419,812

Int. Cl. B29f *3/04*

U.S. Cl. 425—466 **2 Claims**



1. An extrusion die for producing a plurality of streams of extrudate comprising a housing having an inlet and a discharge port and a plenum connecting said inlet and discharge port, said discharge port being a slot-like, horizontally disposed opening having mounted therein a plurality of flow-divider means for dividing said slot into a plurality of orifices, each of said divider means having a fixed side and an adjustable side, said adjustable side being laterally adjustable in relation to the fixed side of an adjacent divider means to control the size of the orifices.

3,887,323

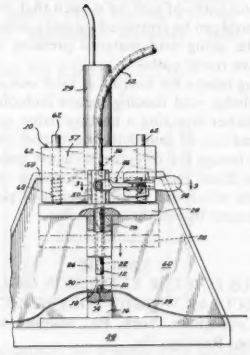
DIE ASSEMBLY FOR HEAT-SEALING TUBING ENDS TO SHEETING IN TRANSVERSE RELATIONSHIP

William Richard Bratten, Waukegan, Ill., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed June 24, 1974, Ser. No. 482,387

Int. Cl. B29c *27/00*

U.S. Cl. 425—521 **7 Claims**



1. A die assembly for use in heat-sealing an end of a plastic tubular member to a sheet member positioned in transverse relation thereto, including a first die having a first die face

defining a protrusion surrounded by a generally flat face portion of said die face, said protrusion being proportioned to be received in the bore of said tubular member; and a tubular second die for receiving said tubular member, said tubular second die defining a second die face at one end thereof proportioned for cooperative sealing action with said first die face; and means for moving said die faces together with portions of said tubular member and sheet member positioned therebetween for said cooperative sealing action; the improvement comprising, in combination:

said protrusion defining a junction surface with the flat face portion, said surface being concavely curved as measured along planes containing the longitudinal axis of said protrusion, said concavely curved surface defining, in said planes, arcs of closed curves having radii of at least 1/32 inch;

said tubular second die having a bore which defines, as part of said second die face, an outwardly bevelled bore end portion, whereby said outwardly bevelled bore end portion and said concavely curved surface cooperate to facilitate the spreading of said end of the tubular member outwardly over said sheet member during said cooperative sealing action, to create a seal of increased strength.

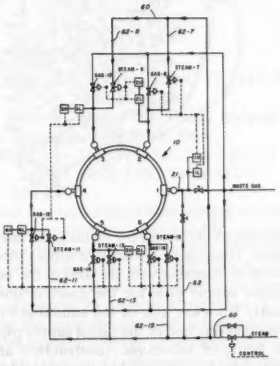
3,887,324
METHOD FOR NON-POLLUTING COMBUSTION OF WASTE GASES

Robert D. Reed; John Smith Zink; Robert F. Schwartz, all of Tulsa, Okla.; Horst Glomm, Frankfort, Germany; John C. Corble, St. Albans, England, and Harold F. Koons, Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Division of Ser. No. 216,659, Jan. 10, 1972, Pat. No. 3,779,689. This application Oct. 15, 1973, Ser. No. 406,210

Int. Cl. F23d *13/20*

U.S. Cl. 431—5 **6 Claims**



1. A method of burning variable quantities of waste gas comprising the steps of:

flowing a purge gas through a conduit to a first gas-air mixing and burner stage immediately prior to the flowing of said waste gas through said conduit;

flowing said waste gas through said conduit to said first burner stage;

igniting said waste gas-air mixture; and the additional steps of:

sensing a pressure or flow condition of said waste gas;

flowing a purge gas through a second gas-air mixing and burner stage responsive to an increase of said pressure or flow;

flowing said waste gas to said first and said second burner stages responsive to further increase in flow and pressure; and

igniting said waste gas-air mixture.

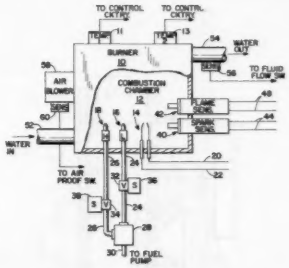
3,887,325
CONTROL METHOD AND APPARATUS FOR BURNERS

John F. Finger, and Merle E. Pochop, both of Beresford, S. Dak., assignors to Sioux Steam Cleaner Corporation, Beresford, S. Dak.

Filed May 29, 1973, Ser. No. 364,826

Int. Cl. F23n *5/20*

U.S. Cl. 431—6 **3 Claims**



1. A method of operating a burner for heating a flowing fluid, the burner having first and second operating temperatures associated therewith, and a combustion chamber for highly volatile explosive fuel requiring an operating combustion air pressure, the method including the following steps:

a. sensing the first operating temperature;

b. sensing the fluid flow;

c. sensing the air pressure;

d. forming a spark only if the sensed first operating temperature, fluid flow, and air pressure are within predetermined operating ranges;

e. directly visually sensing the spark;

f. providing a small amount of said volatile fuel to the combustion chamber only if the spark is visually sensed, the spark igniting the fuel, which in burning forms a flame that is low;

g. sensing the flame;

h. sensing the second operating temperature; and

i. providing a large amount of said volatile fuel to the combustion chamber only if the flame is sensed and the second operating temperature is within a predetermined operating range, the low flame igniting the large amount of fuel which in burning forms a flame that is high.

3,887,326
KILNS AND FURNACES

Harry Townley, Buxton, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 222,071, Jan. 31, 1972, abandoned. This application Sept. 21, 1973, Ser. No. 399,740

Claims priority, application United Kingdom, Feb. 8, 1971, 4122/71

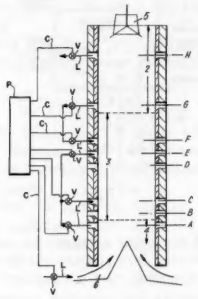
Int. Cl. F23n *1/02*; **F27b** *1/10*

U.S. Cl. 432—14 **26 Claims**

1. In a process for operating a vertical shaft kiln which has a plurality of burners disposed around the shaft and through which solid granular material passes downwardly through the shaft and is contacted while in the shaft with hot gaseous fluid, the improved method of obtaining substantially uniform heat treatment of the material leaving the shaft which comprises controlling the flow pattern of said hot gaseous fluid in a manner to obtain a temperature distribution of the hot gaseous fluid in the shaft which is asymmetrical in a horizontal plane at a given level in the shaft so that heating of the downwardly moving material passing through said plane is nonuniform across the shaft and varying the flow pattern of said hot gaseous fluid in a manner to change the asymmetrical temperature distribution at said given level in accordance with

a predetermined sequence, all the granular material passing downwardly through the kiln receiving substantially the same overall heat treatment.

22. A vertical shaft kiln comprising: a shaft through which solid granular material passes downwardly during operation of the kiln; a plurality of burners disposed symmetrically around the shaft at a plurality of levels in the shaft for introducing hot gaseous fluid into the shaft; means for controlling the flow pattern of the hot gaseous fluid in the shaft in a manner to



obtain at each of a plurality of levels a temperature distribution of the hot gaseous fluid which is asymmetrical in a horizontal plane so that heating of downwardly-moving material passing through each of said planes is non-uniform across the shaft; and programming means for varying the control means in a manner to change the asymmetrical temperature distribution at said levels in accordance with a predetermined sequence so that all the granular material passing downwardly through the kiln receives substantially the same overall heat treatment.

3,887,327

TUNNEL KILN FOR THE HEAT TREATMENT OF PRODUCTS HAVING A CIRCULAR CROSS-SECTION

Jean Weber, Tarbes, and Jean Moussou, Bagneres De Bigorre, both of France, assignors to Ceraver, Paris, France

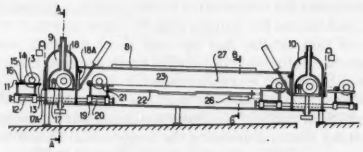
Filed Apr. 25, 1974, Ser. No. 464,091

Claims priority, application France, May 8, 1973, 73.16587

Int. Cl. F27b *9/24*

U.S. Cl. 432—124 **13 Claims**

1. In a tunnel kiln for the heat treatment of products having a circular cross-section by moving them along a longitudinal axis of the kiln, the improvement comprising: a drum mounted for rotation about its axis and for progressing through said kiln by rolling along the longitudinal axis thereof, and means for supporting said products within said drum for rotation about their axis at right angles to the longitudinal axis of the kiln and



for simultaneously travelling in a circular path about the axis of said drum and at right angles to the longitudinal axis of said kiln.

3,887,328

HEAT TREATMENT APPARATUS

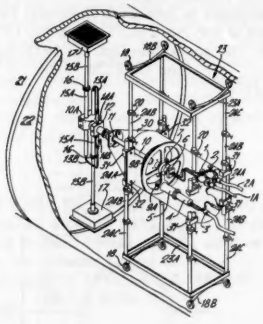
Paul Thomas Maddock, 92 Alltwen Hill Pontardaive, Swansea Glamorganshire, England

Filed Feb. 4, 1974, Ser. No. 439,330

Claims priority, application United Kingdom, Feb. 8, 1973, 6129/73

Int. Cl. F23d *13/26*

U.S. Cl. 432—224 **7 Claims**



1. Heat treatment apparatus for heating the internal surface of a metal pipe, comprising a rotatable supply pipe for a gaseous fluid which is alignable with the axis of the metal pipe, at least one radial supply pipe for the gaseous fluid extending perpendicularly from the axis of the rotatable supply pipe, a heater mounted at one end of the radial supply pipe, the radial supply pipe being of telescopic construction and having a socket portion which is clamped to the rotatable supply pipe and extends equally on both sides of the rotatable supply pipe and an inner portion which extends from one end of the socket portion and is of substantially the same length as the socket portion, and a branch supply pipe connected between the other end of the socket portion of the radial supply pipe and the rotatable supply pipe.

3,887,329
HEXAMETHYL PHOSPHOTRIAMIDE-DYE COMPOSITIONS

Gert Hegar, Schoenenbuch; Hans-Joerg Angliker, Basel; Walter Lang, Pfeffingen; Hans Wilhelm Liechti, Oberwill, Baseland, and Branimir Milicevic, Riehen, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 222,673, Feb. 1, 1972, abandoned, which is a continuation of Ser. No. 34,560, May 4, 1970, abandoned. This application Feb. 22, 1974, Ser. No. 446,200

Claims priority, application Sweden, May 5, 1969, 6832/69; Apr. 2, 1970, 4884/70

Int. Cl. D06p *1/38*

U.S. Cl. 8—171 **13 Claims**

1. A stable dye concentrate consisting essentially of at least one substantially pure dyestuff and hexamethylphosphotriamide, said concentrate containing from about 20 to about 50 percent by weight of dyestuff.

3,887,330
SULFUR-HYDROCARBON SLURRY PIPELINE TRANSPORTATION CONTAINING AN INORGANIC CORROSION INHIBITOR

Richard J. Horvath, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 36,994, May 13, 1970, abandoned. This application Jan. 8, 1973, Ser. No. 321,885

Int. Cl. B65g *53/04;* **C23f** *11/16*

U.S. Cl. 21—2.5 R **2 Claims**

1. A method for preventing the sulfur corrosion of ferrous materials in contact with a sulfur-hydrocarbon slurry comprising admixing ammonium polysulfide with the slurry, the ammonium polysulfide comprising an aqueous solution of from about 0.01% to about 10% by weight based on total slurry.

3,887,331
METHOD FOR EVALUATING PETROLEUM RESERVOIRS

Bernard A. Baldwin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 13, 1971, Ser. No. 143,214

Int. Cl. C10g *1/04;* **G01n** *33/24*

U.S. Cl. 23—230 EP **5 Claims**

1. A method for evaluating a core sample to determine the fluid-surface interactions of recoverable organic material retained within the core sample which method comprises determining relative amounts of the different types of recoverable organic material retained within the core sample at various degrees of tenacity by (a) seriatim elution of said organic material from the core sample with solvents of successively greater solvent strength and (b) characterization of the functional groups and classes of compounds in each eluted fraction thereby determining the surface of interest for recovery of oil.

3,887,332
METHOD OF DETERMINING UNSATURATED IRON BINDING CAPACITY IN SERUM

Kazuei Takase, and Junji Morikawa, both of Tokyo, Japan, assignors to Eiken Chemical Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1973, Ser. No. 348,097

Claims priority, application Japan, Apr. 12, 1972, 47-36643

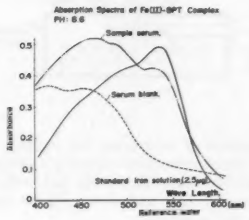
Int. Cl. G01n *33/16*

U.S. Cl. 23—230 B **4 Claims**

1. A method of determining the unsaturated iron binding capacity of transferrin in serum comprising the steps of:

preparing a standard solution of iron chelate in which a known amount of iron is bound with nitrilotriacetic acid by using a buffer solution of pH 8.4 to 8.6;

adding the said standard iron solution to a sample serum in order to saturate the iron binding capacity of transferrin in the said serum;



reducing the excessive iron remaining unbound with transferrin by adding a salt of ascorbic acid to the said saturated solution;

developing a color by adding sodium bathophenanthroline to the said reduced solution, and

determining the absorbance of the said colored solution.

3,887,333
LIQUID SENSITOMETRY PROCESS FOR PHOTOGRAPHIC EMULSIONS

Norihisa Mimura; Takao Uehaka, and Hisatoyo Kato, all of Kanagawa, Japan

Continuation of Ser. No. 188,059, Oct. 12, 1971, abandoned. This application Nov. 9, 1973, Ser. No. 414,498

Claims priority, application Japan, Oct. 9, 1970, 45-89103

Int. Cl. G01m *21/20, 33/00;* **G03c** *5/26*

U.S. Cl. 23—230 R **5 Claims**

1. A process of continuously determining the photographic characteristics of a photographic silver halide emulsion, which process comprises the steps of:

a adding a developing solution to a first sample of a photographic emulsion which has not been exposed to light and to a second sample of the photographic emulsion which has been exposed to a predetermined quantity of light;

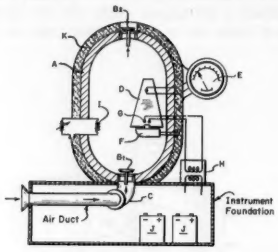
b continuously measuring the development rate during the development of each of said samples by using light having a wavelength to which the photographic emulsion is not sensitive and measuring the amount of said light absorbed by each of said samples; and

c comparing the resultant measurements for each of said samples to determine the photographic properties of the photographic emulsion.

3,887,334
OXYGEN METER

Julius Bago, 83-10 35th Ave., Jackson Heights, N.Y. 11372

Filed Apr. 13, 1973, Ser. No. 350,305
Int. Cl. G01n 25/32, 31/12
U.S. Cl. 23—232 E 7 Claims

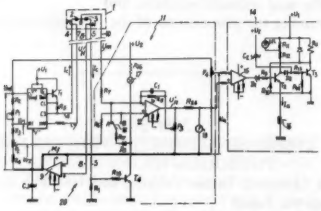


1. The method of measuring the oxygen content of the atmosphere which comprises enclosing a sample of the atmosphere in a closed vessel, delivering fuel to the interior of the vessel, igniting the fuel, and measuring the temperature at a point within the vessel.

3,887,335
ELECTRICAL MEASURING AND MONITORING APPARATUS UTILISING A REMOTE DETECTOR

Maurice Boutonnat, Verneuil-En-Halatte, France, assignor to Charbonnages de France, Paris and MSA de France, Asnieres, both of, France

Filed Nov. 27, 1973, Ser. No. 419,371
Claims priority, application France, Nov. 29, 1972, 72.42382
Int. Cl. G01n 27/16; G05f 1/40, 1/60
U.S. Cl. 23—254 E 3 Claims

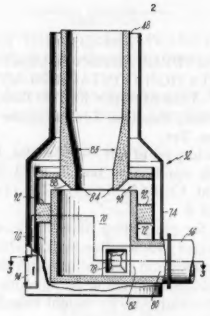


1. An electrical apparatus for measuring and monitoring a parameter, comprising measuring and monitoring means for generating a measurement signal, detector means adapted for connection to said measuring and monitoring means and adapted for being spaced at a distance therefrom, conductors connecting said measuring and monitoring means and said detector means and feeding voltage and current to the detector means and transmitting to the measuring and monitoring means information obtained by the detector means, said measuring and monitoring means including a supply source for feeding direct current to the detector means and including a control circuit coupled to and operable to maintain a constant voltage at the detector means, said detector means including sensing elements adapted to generate a measurement signal in the form of a direct voltage, and a servo-controlled floating ground connected to said measuring and monitoring means and controlled at least in part thereby to provide for said measuring and monitoring means a reference potential which is controlled to be at least substantially equal to the voltage applied to the detector means.

3,887,336
INCINERATION SYSTEMS AND METHODS

Bruce R. Hutchinson, 25 Crestview Dr., Bloomfield, Conn. 06804; Bruce H. Hunter, 53 Oak Rd., Longmeadow, Mass. 01106, and Robert H. Brooks, 239 Auburn Rd., West Hartford, Conn. 06119

Division of Ser. No. 125,752, March 18, 1971. This application Apr. 25, 1973, Ser. No. 354,167
Int. Cl. F23c 9/04; F23g 7/06
U.S. Cl. 23—277 C 8 Claims



1. An afterburner device comprising:
a combustion chamber having a generally cylindrically shaped wall, said combustion chamber being open at its upper end;
a particulate collection chamber disposed about the exterior of said combustion chamber;
means for tangentially injecting a gaseous effluent into said combustion chamber adjacent the bottom thereof;
means for injecting a flame into the path of the gaseous effluent in said combustion chamber;
temperature responsive means for controlling said flame injecting means whereby a temperature sufficiently high to insure complete combustion of the effluent is maintained in the said combustion chamber; and
afterburner exhaust stack means supported concentrically of and generally above the open upper end of said combustion chamber, said exhaust stack means having a lower end, said lower end of said exhaust stack means defining an outlet orifice for gases from said combustion chamber, the lower end of said exhaust stack means which defines said outlet orifice bein of smaller diameter than said combustion chamber, the wall of said combustion chamber cooperating with said lower end of said exhaust stack means to define an annular discharge port adjacent the open upper end of said combustion chamber, said annular discharge port providing communication between said combustion chamber and said collection chamber.

3,887,337
FLUIDIZATION COLUMN

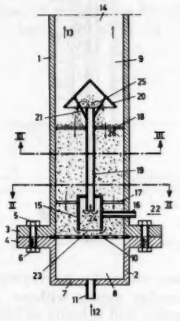
Freddy Francois Eugene Descamps, Halle; Georges Luciaan Dumont, and Walter Remi Adele Goossens, Mol, all of Belgium, assignors to Studiecentrum Voor Kernenergie SCK, Brussels, Belgium

Filed Aug. 21, 1972, Ser. No. 282,226

Claims priority, application Belgium, Aug. 19, 1971, 771545

Int. Cl. B01j *1/00*; **F26b** *17/14*; **B01f** *13/02*

U.S. Cl. 23—284 **1 Claim**



1. A fluidization column comprising a hollow body, a perforated plate across the body which separates the body internally into a lower space and an upper space, a fluidization gas inlet opening into the body lower space, an outlet from a top of the body upper space, a bell in the body upper space, said bell opening downward, being spaced from and facing the perforated plate, the spacing between said perforated plate and the bell lower edge being about 1 cm and the ratio of the bell lower side area to the plate lying between ½ and 1/10, an open-top riser pipe in the body upper space with the lowermost end of said riser pipe operatively connected through the top of said bell, the ratio of the bell lower side area to the riser pipe cross-section lying between 3 and 50, and a duct for supplying supplementary gas to the riser pipe, the inlet of which duct lies outside the body and which duct opens into the side of the bell.

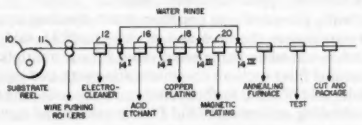
3,887,338
PLATED WIRE MEMORY

Guy DiGuilio, Philadelphia, Pa., assignor to Sperry Rand Corporation, Blue Bell, Pa.

Division of Ser. No. 375,266, June 29, 1973, Pat. No. 3,853,717. This application Apr. 22, 1974, Ser. No. 463,002

Int. Cl. B23p *3/00*; **G11c** *11/02*; **C22c** *19/00*

U.S. Cl. 29—191.6 **5 Claims**



1. An improved plated wire memory device having a smooth non-magnetic wire substrate of the group consisting of beryllium-copper and phosphor bronze, a nodular intermediate layer of copper, the improvement comprising:

a. a magnetic film deposited upon said intermediate layer comprising by weight in the range of about 17–18% Fe, 2–5% Co and 0.5–2.0% P and the balance essentially nickel,

b. whereby said memory is operative in the NDRO mode, and

c. said film being substantially non-magnetostrictive.

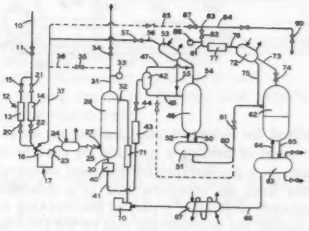
3,887,339
INDUSTRIAL TECHNIQUE

Donald Hancher Robertson, Madison Heights, Va., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 19, 1973, Ser. No. 417,434

Int. Cl. B01d *53/14*

U.S. Cl. 55—66 **3 Claims**



1. In a process for purifying radioactive krypton and xenon mixed with a carrier gas that comprises the steps of compressing the gas mixture, contacting the gas mixture with a fluorocarbon solvent to absorb said krypton and xenon and a residual amount of said carrier gas in said solvent thereby to load said solvent, contacting said loaded solvent with more fluorocarbon solvent vapor to separate said residual carrier gas from said loaded solvent and leave a solvent that is rich in radioactive krypton and xenon, contacting said krypton and xenon rich solvent with further fluorocarbon solvent vapor to separate the krypton and xenon gas from said solvent, and drying the krypton and xenon gas to further purify the gas, the improvement comprising registering the radioactivity of said purified gas to selectively store the purified gas when the intensity of the registered radioactivity exceeds a preselected level and reintroduce the purified gas into the process when the intensity of the registered radioactivity is below said level.

3,887,340
METHOD FOR SCRUBBING GASES DERIVED FROM BASIC OXYGEN FURNACES

Yuan Tsun Hsu, Cornwells Heights, and K. Robert Lange, Huntingdon Valley, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Aug. 29, 1974, Ser. No. 501,574

Int. Cl. B01d *47/06*

U.S. Cl. 55—72 **7 Claims**

1. A method of scrubbing flue gases derived from a basic oxygen furnace used in steel production which comprises treating said gases with an aqueous medium containing from about 0.5 to 300 parts per million of a combination of

i. a water soluble sulfonated polystyrene, and

ii. a compound having the formula: $(X)_2N-R-N(X)_2$, wherein R is a lower alkylene of from 1 to 7 carbon atoms, X is hydrogen or the group $-CH_2PO_3M_2$, where M is a water-soluble cation, the compound further characterized in that at least one and preferably all X's are $-CH_2PO_3M_2$

3,887,341
METHOD OF AND APPARATUS FOR AUTOMATIC CLEANING OF AN AIR FILTER

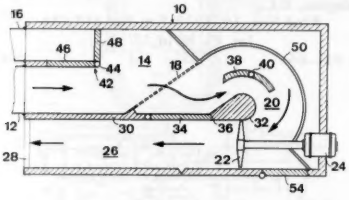
Hanspeter Sutter, Uster, Switzerland, assignor to Luwa AG, Zurich, Switzerland

Filed Jan. 15, 1973, Ser. No. 323,973

Claims priority, application Switzerland, Jan. 20, 1972, 814/72

Int. Cl. B01d *46/04*

U.S. Cl. 55—96 **12 Claims**



1. A method for automatically cleaning an air filter, comprising the steps of guiding a working air current containing contaminants in a predetermined direction of travel through the air filter from an upstream side to a downstream side thereof, suddenly deflecting a part of the working air current which has passed the downstream side of the filter to impinge the filter in the form of a shock wave at the downstream side of said filter, partially shutting off the working air current flowing on the downstream side of the filter and traveling in said predetermined direction, and deriving the energy of the shock wave from the working air current due to the sudden deflection of the part of the working air current.

3. An apparatus for automatically cleaning an air filter, comprising a filter housing, an air filter within the filter housing dividing said filter housing into a raw air compartment and a clean air compartment, an inlet opening communicating with the raw air compartment, a blower having a suction side and a pressure side, the suction side of the blower being in flow communication with the clean air compartment, deflecting means mounted for movement between two positions, said deflecting means in one position communicating the pressure side of the blower with the atmosphere, said deflecting means in the other position communicating the pressure side of the blower with the clean air compartment and providing a bypass flow path from the pressure side of the blower to the clean air compartment during cleaning of the filter, means for at least partially shutting-off the suction side of the blower with respect to at least a portion of the clean air compartment, and means for simultaneously actuating the shut-off means together with the deflecting means.

3,887,342
LIQUID-GAS SEPARATOR UNIT

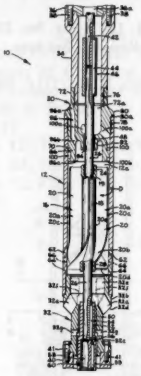
Philip R. Bunnelle, Santa Clara, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Nov. 10, 1972, Ser. No. 305,645

Int. Cl. B01d *19/00*

U.S. Cl. 55—203 **38 Claims**

1. A liquid-gas separator unit comprising, in combination, means defining a chamber having first and second longitudinally spaced portions, impeller means disposed within the chamber between the first and second chamber portions, said impeller means including vanes configured to impart circular motion to liquid after first imparting upward motion to the liquid, means connected to the impeller means for rotating said impeller means, intake means communicating with the first chamber portion for admitting a liquid-gas mixture into said first chamber portion, discharge means communicating with the second chamber portion for discharging the liquid and gas components of the mixture from said second chamber portion after such components have been separated within the chamber by the rotation of the impeller means, said discharge means including passage means for conveying the gas component from the impeller means, said discharge means further



including passageway means for conveying the liquid component from the impeller means without causing an abrupt change in the direction and velocity of the liquid component as it flows into the passageway means.

3,887,343
POCKET OR BAG FILTER WITH DUST RECIRCULATION

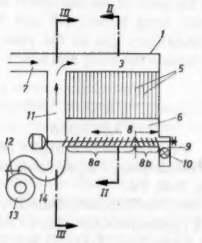
Adolf Margraf, 4961 Wendthagen, Im Haberkamp 196, Germany

Filed Mar. 22, 1973, Ser. No. 343,804

Claims priority, application Germany, Mar. 28, 1972, 2214983

Int. Cl. B01d *51/04*

U.S. Cl. 55—262 **5 Claims**



1. A filtering apparatus comprising:

a housing provided with partition means dividing same into a purification chamber and an exit manifold, said purification chamber being subdivided into a multiplicity of parallel filter sections communicating with said exit manifold, said housing further forming a dust-collecting trough extending underneath said filter sections and communicating therewith;

a supply duct for incoming dust-laden gas to be purified, said supply duct opening onto said filter sections for delivering a continuous flow of said gas to filtering surfaces thereof adapted to retain accompanying solids;

extractor means in said trough for removing dust particles descending from said filter sections, said extractor means including a first and a second conveyor element for transporting predetermined fractions of accumulating dust to opposite ends of said trough, said housing being provided

with a channel communicating with said supply duct and with one of the ends of said trough;

blower means communicating with said channel for driving one of said fractions of accumulated dust back into said supply duct; and

discharge means at the other end of said trough for removing the other of said fractions from said housing.

3,887,344

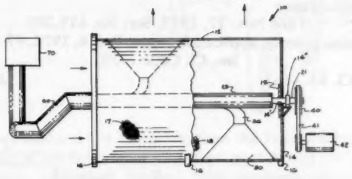
SELF-CLEANING FILTER

Randall E. Smith, Rt. 10, Box 312, Spartanburg, S.C. 29303

Filed Nov. 19, 1973, Ser. No. 417,418

Int. Cl. B10d *46/24*

U.S. Cl. 55—294 **15 Claims**



1. A self-cleaning air filter comprising:

a. a stationary cylindrical housing, said housing having one closed end and one end for receiving air to be filtered and having filter media secured therewithin immediately adjacent said housing and at least partially around the circumference thereof, said housing having at least one channel in a wall thereof, said channel extending longitudinally thereof;

b. a manifold supported for rotation centrally along said housing;

c. at least one nozzle positioned along said manifold and in communication therewith, said nozzle residing immediately adjacent said filter media inside said housing;

d. means to rotate said manifold and said nozzle around the interior of said housing whereby substantially all of the filter media around said housing is subjected to said at least one nozzle, said at least one channel in said wall of said housing being of sufficient size to receive accumulations of waste that will not pass between said nozzle and said filter media, whereby said accumulations of waste are forced ahead of said nozzle, fall into said channel, and pass into said nozzle from within said channel; and

e. suction supply means in communication with said manifold and said at least one nozzle, whereby suction in said nozzle removes said materials from said filter media and said channel as said nozzle moves therearound.

3,887,345

GAS CHROMATOGRAPH INJECTION SYSTEM

Glenn E. Pollock, Belmont; Milton E. Henderson, Mountain View, and Ralph W. Donaldson, Jr., Sunnyvale, all of Calif., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 180,962, Sept. 16, 1971, abandoned. This application Feb. 27, 1974, Ser. No. 446,564

Int. Cl. B01d *15/08*

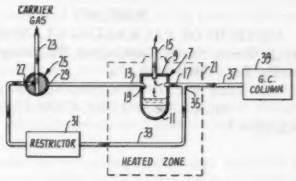
U.S. Cl. 55—386 **6 Claims**

1. An injection system for a gas chromatographic column comprising in combination:

a. an injection chamber for receiving a sample to be analyzed;

b. valve means for controlling the flow of carrier gas;

c. said chamber having three conduits leading into said chamber, a first conduit for inserting a sample into said chamber and for venting gas and solvent, a second conduit connected through a restrictor to said valve means and to said chamber for injecting carrier gas into said chamber, and a third conduit connected to said valve means and said chromatographic column for injecting gas



into said chamber and for sweeping a vaporized sample into said chromatographic column;

d. means for closing said 1st conduit; and

e. flash heating means for heating said chamber and for vaporizing said sample.

3,887,346

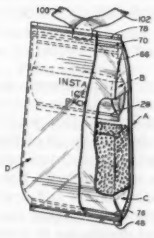
CHEMICAL THERMAL PACKAGE WITH THREE SEPARATE CHAMBERS

Lynn Ellynn Erdman, P.O. Box 30182, Cleveland, Ohio 44130

Continuation-in-part of Ser. No. 178,071, Sept. 7, 1971, abandoned. This application Feb. 11, 1974, Ser. No. 441,243

Int. Cl. F25d *5/00*

U.S. Cl. 62—4 **1 Claim**



1. A chemical package A containing at least one chemical reactant (**72**) and an activating liquid (**60**) and comprising three generally rectangular outer, second and inner containers,

each of said containers being constructed from a thin flexible material and having a continuous sidewall with the ends thereof hermetically sealed by lateral seams, the outer container being a protective cover enveloping the second container, the second container containing a predetermined amount of a chemical reactant and enveloping the inner container, the inner container containing a predetermined amount of the activating liquid,

one end of said inner container being closed after filling with the activating liquid by a lateral seam (**66**) spaced at a distance from said liquid so as to provide room for expansion thereof,

said one end of said inner container being positioned at one end of said second container by a lateral seam (**70**) on said second container, said dual lateral seams assuring that the activating liquid will not flow from the inner container in the event one of said dual lateral seams should be broken,

said inner and second containers being positioned at one end of said outer container by a lateral seam (**78**) assuring that said inner container holding said activating liquid

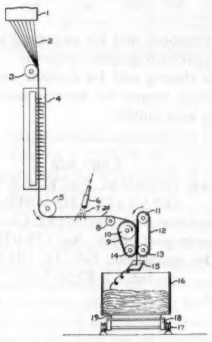
and said second container holding said chemical reactant will not float within said outer container, and further assuring that the activating liquid will not flow from the inner container in the event both of said dual lateral seams should be broken.

3,887,347

METHOD OF PACKAGING GLASS STRAND

Walter J. Reese, North Huntington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 1, 1974, Ser. No. 457,014
Int. Cl. C03c *25/02*; C03b *37/02*
U.S. Cl. 65—3 **6 Claims**



1. A method of collecting fibrous glass strand comprising drawing a plurality of glass fibers from a molten glass source; applying size to said fibers as they are being drawn; drying the fibers to remove substantially all of the moisture therefrom; rewetting the fibers to supply 2 to 6 percent by weight water therein; passing the moisture laden fibers in strand form into a container in random layers and drying the strand in said container to remove a substantial portion of the moisture applied to the strand during the moisture treatment step.

3,887,348

GLASS COLORING PROCESS

Emile Plumat, Gilly; Jean Schottey, Montignies-sur-Sambre, and Francois Toussaint, Montignies Le Tillful, all of Belgium, assignors to Glaverbel S.A., Watermael-Boitsfort, Belgium

Continuation of Ser. No. 293,032, Sept. 28, 1972, abandoned. This application June 27, 1974, Ser. No. 485,843
Claims priority, application Luxembourg, Oct. 1, 1971, 63992
Int. Cl. C03c *21/00*
U.S. Cl. 65—30 **11 Claims**

1. A process for imparting a yellow coloration to soda-lime-silica glass bodies of ordinary composition containing a small concentration of reducing ions in at least the surface layers of a portion thereof and having no visible coloration, comprising the steps of:

placing the surface of such a body which is associated with such surface layers in contact with a contacting medium composed of a mixture of molten metal salts, which mixture includes a silver salt present in a concentration of between 0.01 percent and 3 percent, by weight, and furnishing reducible silver ions capable of being reduced by the reducing ions in the surface layers in such a manner as to impart a yellow coloration to the body; said placing being under concentration, temperature and time conditions such as to cause such reducible ions to diffuse into such body surface layers without giving a significant visible coloration to the glass; and

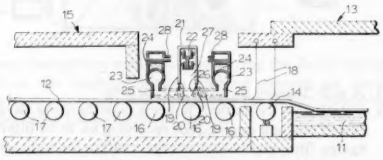
subsequent to such diffusion, heating such body to a temperature above the strain point of the glass and higher than the temperature employed during said step of placing for a time sufficient to cause the body to develop a yellow coloration.

3,887,349

APPARATUS FOR MANUFACTURING RIBBON GLASS HAVING A METAL OXIDE COATING

Naotomo Akashi, Maizuru, and Katsuji Fujimoto, Ichihara, both of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Nov. 27, 1973, Ser. No. 419,280
Claims priority, application Japan, Dec. 6, 1972, 47-122932
Int. Cl. C03c *17/00*
U.S. Cl. 65—161 **2 Claims**



1. In an apparatus for manufacturing ribbon glass having as part thereof means for forming a metal oxide coating on the surface of ribbon glass which is positioned at a spraying locale between means for forming ribbon glass and a lehr or within the lehr, said means for forming a metal oxide coating including spray guns which face the surface of the ribbon glass and movable across the ribbon glass, means for feeding metal compound solution to the spray guns, means for spraying the solution from the spray guns, a pair of exhaust ducts disposed on both sides of the path of travel of the spray guns having suction ports facing downwardly from the exhaust ducts and an exhaust system connected to the exhaust ducts, the improvement comprising wind duct means having openings in the spraying locale, defined by the exhaust ducts and the ribbon glass, for blowing a heated gas into the spray locale, a gas burner means connected to the wind duct means, and diluent air-intake openings disposed in said wind duct means between said burner means and said openings for supplying diluent air to control the temperature of the products of combustion from said gas burner means.

3,887,350

FLUID COOLING OF GLASS MOLDS

Charles W. Jenkins, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 11, 1974, Ser. No. 441,664
Int. Cl. C03b *9/38*
U.S. Cl. 65—267 **10 Claims**

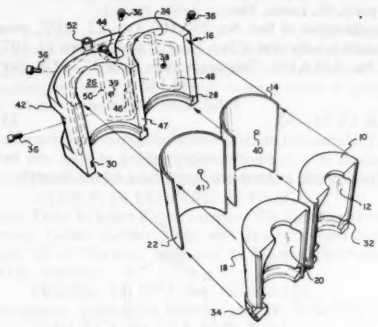
1. A split mold for forming heated thermoplastic materials wherein each mold section comprises, in combination:

an insert portion having a front face including a cavity shaped in the form desired for the thermoplastic material to assume and a rear face;

an insert holder, substantially surrounding said rear face of said insert portion, having formed therein a plurality of inter-connected fluid passages, said passages having an inlet and an outlet; and

a heat insulating sleeve, positioned between said insert portion rear face and said insert holder and in contact with substantially the entire interface area of both, said

inter-connected passages being positioned proximate to but separated from said heat insulating sleeve, said insulating sleeve being formed of a material having a heat conductivity value of between one hundred and twenty



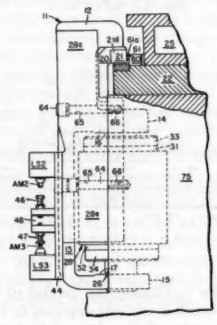
times less and ten times less than the heat conductivity value of the material of said insert portion and said insert holder, said insert portion, heat insulating sleeve and insert holder being secured together as a unit.

3,887,351

COMBINED TURRET POSITIONER AND CLAMP ASSEMBLY FOR GLASS PRESSING MACHINE

Frederick A. Dahlman, Corning, N.Y.; Raymond J. Mras, deceased, late of Lisle, N.Y., and by Carl A. Mras, executor, Lisle, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed July 29, 1974, Ser. No. 492,510
Int. Cl. C03b *11/00*
U.S. Cl. 65—305 **4 Claims**



1. In combination with a rotatable turret of a turret-type glass pressing machine having a circular row of mold adaptors equally spaced apart about a peripheral portion thereof with means adapted to successively index said adaptors to each of a plurality of positions including a glass pressing position at which an anvil is arranged under and adjacent to said turret in close proximity thereto, a combined turret positioner and hold-down clamp assembly for said glass pressing position, such assembly comprising;

A. circular rail means including a plurality of similar arcuate and slightly spaced apart rail segments extending about said turret adjacent the outer periphery thereof and equal in number to said mold adaptors, each such rail segment embodying in the upper surface thereof a channel, each such channel being congruent with the others and each having a vertical cross-sectional configuration of an inverted truncated isoceles triangle and each rail segment being similarly located adjacent an associated one of said mold adaptors with the channel in the respective segment precisely positioned in relation to the respectively associated adaptor;

B. a vertically actuable wedge member at said glass pressing position, said wedge member including a portion having a cross-sectional configuration corresponding to said configuration of each said channel and such wedge portion being normally positioned above said rail means in close proximity thereto;

C. motor means for actuating said wedge member downwardly and said wedge portion into each said channel as each respective rail segment is indexed to said glass pressing position and for thereafter actuating such wedge portion out of each such channel; and

D. control means for energizing said motor means in a first mode to start said downward actuation of said wedge member as the leading upper edge of each respective channel is moved vertically below the corresponding lower edge of the wedge portion of such wedge member and to continue such downward actuation until the ends of the wedge portion are in firm contact with the ends of the respective channel and said turret is actuated into firm contact with said anvil, and for thereafter energizing said motor means in a second mode to actuate said wedge portion upwardly out of each respective channel.

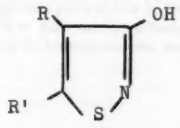
3,887,352

CONTROL OF MICROORGANISMS WITH 3-HYDROXYISOTHIAZOLES

Sheldon N. Lewis, Willow Grove; George A. Miller, Glenside, and Andrew B. Law, Levittown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 855,046, Sept. 3, 1969, abandoned, which is a continuation-in-part of Ser. No. 672,427, Oct. 3, 1967, abandoned, which is a continuation-in-part of Ser. No. 621,766, March 9, 1967, abandoned. This application Feb. 3, 1972, Ser. No. 223,350
Int. Cl. A01n *9/12*
U.S. Cl. 71—67 **3 Claims**

1. A method for controlling the growth of bacteria, fungi, or algae in a locus subject to contamination by bacteria, fungi, or algae which comprises contacting the bacteria, fungi, or algae in the locus with an amount effective to adversely affect the growth of the bacteria, fungi, or algae of a compound of the formula



wherein R is hydrogen, $(C_1\text{-}C_4)$alkyl, carboxy, carb$(C_1\text{-}C_4)$alkoxy,

carbamoyl, nitro, halogen, or cyano, and R′ is hydrogen, $(C_1\text{-}C_4)$alkyl, $(C_1\text{-}C_4)$haloalkyl, aralkyl of up to 8 carbon atoms, aryl of up to 8 carbon atoms,

halogen, $(C_1\text{-}C_4)$alkylsulfinyl, aralkylsulfinyl of up to 8 carbon atoms, $(C_1\text{-}C_4)$alkylsulfonyl, aralkylsulfonyl of up to 8 carbon atoms, $(C_1\text{-}C_4)$alkylthio, aralkylthio of up to 8 carbon atoms, alkylamino of up to 8 carbon atoms, arylamino of up to 8 carbon atoms, or aralkylamino of up to 8 carbon atoms,

or a salt of said compound with a strong acid, or a salt of said compound with an alkali metal cation, an alkaline earth metal cation, a transition metal cation, a quaternary ammonium cation, a quaternary phosphonium cation, or a primary, secondary, or tertiary organic base cation.

3,887,353

DIETHYL BETAAMINOETHYLPHOSPHONATE AS AN ALGAECIDE

Al F. Kerst, Alma, Mich., and John D. Douros, Jr., Gaithersburg, Md., assignors to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 156,940, June 25, 1971, Pat. No. 3,764,677. This application Mar. 9, 1973, Ser. No. 339,680
Int. Cl. A01n *9/00*
U.S. Cl. 71—67 **16 Claims**

1. A method of killing and inhibiting the growth of algae which comprises contacting said algae with diethyl betaaminoethylphosphonate in an amount effective to kill and inhibit the growth of said algae.

3,887,354

METHOD FOR FACILITATING THE HARVEST OF FRUIT

Milton C. Archer, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Sept. 21, 1973, Ser. No. 399,663
Int. Cl. A01n *9/12*
U.S. Cl. 71—90 **10 Claims**

1. A method for facilitating the harvest of fruit which comprises applying an effective concentration of 4,5-dibromothiophene-2-carboxylic acid to fruit bearing trees or plants within 2 weeks of the date of harvest.

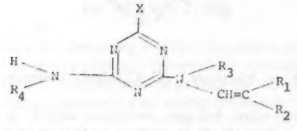
3,887,355

HERBICIDAL COMPOSITION AND METHODS EMPLOYING N-(1-ALKEN-1-YL)-AMINO-S-TRIAZINE COMPOUNDS

John P. Chupp, Kirkwood, and Ching C. Tung, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 243,091, April 11, 1972, abandoned, which is a division of Ser. No. 103,881, Jan. 4, 1971, Pat. No. 3,784,544. This application June 17, 1974, Ser. No. 479,933
Int. Cl. A01n *9/22*
U.S. Cl. 71—93 **16 Claims**

1. Herbicidal method which comprises applying a herbicidal amount of a composition comprising at least one herbicidal adjuvant and at least one compound of the formula



where X represents chloro or alkylthio of a maximum of 4 carbon atoms;

R_1 represents alkyl of a maximum of 2 carbon atoms;

R_2 represents alkyl of a maximum of 4 carbon atoms;

R_3 and R_4 each represents alkyl of a maximum of 4 carbon atoms.

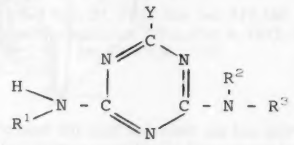
3,887,356

HERBICIDAL COMPOSITIONS AND METHODS EMPLOYING N-(1-CYCLOALKEN-1-YL)-AMINO-S-TRIAZINE

John P. Chupp, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 297,109, Oct. 12, 1972, abandoned, which is a division of Ser. No. 127,625, March 24, 1971, Pat. No. 3,714,162. This application June 17, 1974, Ser. No. 480,183
Int. Cl. A01m *9/22*
U.S. Cl. 71—93 **23 Claims**

1. Herbicidal method which comprises applying a herbicidal amount of a composition comprising at least one herbicidal adjuvant and at least one compound of the formula



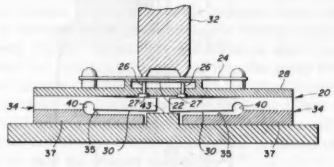
wherein Y is chloro, alkoxy or alkylthio containing up to 4 carbon atoms, R^1 is alkyl or alkoxyalkyl containing a maximum of 8 carbon atoms, R^2 is alkyl containing a maximum of 8 carbon atoms provided that the sum of the carbon atoms in the groups represented by R^1 and R^2 is at least 4, and R^3 is a 1-cyclopenten-1-yl, a 1-cyclohexen-1-yl, a 1-cyclohepten-1-yl or a lower alkyl or lower alkoxy substituted 1-cyclopenten-1-yl, 1-cyclohexen-1-yl or 1-cyclohepten-1-yl group.

3,887,357

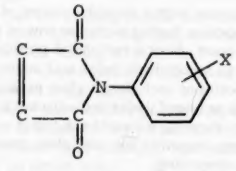
METHOD FOR FACILITATING THE HARVEST OF FRUIT

Milton C. Archer, Olivette, and John E. Franz, Crestwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 31, 1973, Ser. No. 411,584
Int. Cl. A01n *9/22*
U.S. Cl. 71—95 **10 Claims**



1. A method for facilitating the harvest of fruit from non-deciduous trees which comprises applying to the fruit bearing trees, within 2 weeks of the date of harvest, an effective amount of a compound of the formula



wherein X is 2-chloro, 4-chloro, 3-nitro, 4-methyl or 4-methoxy.

3,887,358

METHOD FOR FACILITATING THE HARVEST OF FRUIT

Milton C. Archer, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Sept. 25, 1973, Ser. No. 400,575
Int. Cl. A01n 9/20
U.S. Cl. 71—104 10 Claims

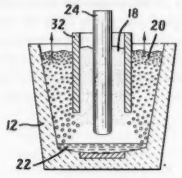
1. A method for facilitating the harvest of fruit which comprises applying an effective concentration of 3,5-dichloro-4-hydroxyphenylisothiocyanate to fruit bearing trees or plants within 2 weeks of the date of harvest.

3,887,359

REDUCTION OF SILICON DIOXIDE BY MEANS OF CARBON IN ELECTRIC FURNACE

Rolf Enger, Oslo; Kristian Piene, Svelgen; Nils Skreien, Skedsmokorset; Audun Saethre, Oslo, and Jan-Erik Thorslund, Nittedal, all of Norway, assignors to Elkem-Spigerverket A/S, Oslo, Norway

Filed Jan. 16, 1973, Ser. No. 324,114
Claims priority, application Norway, Jan. 25, 1972, 173/72
Int. Cl. C21c 5/52; C01b 33/02
U.S. Cl. 75—11 10 Claims



1. In the method of producing silicon and silicon-containing alloy products in an electric furnace which involves the reduction of SiO_2 with carbon reducing reagent by energy supplied by one or more electrodes in the furnace, the improvement which comprises the steps of feeding at least a major amount of the reaction SiO_2 material in the charge into the furnace separate from the carbon reducing reagent in the charge and establishing at least two separate zones in the furnace one of which has a major amount of SiO_2 material and the other of which has a major amount of carbon reducing reagent and wherein reaction off gases from the reduction of SiO_2 pass through one or more zones rich in carbon reducing agent.

3,887,360

METHODS AND FURNACES FOR STEEL MANUFACTURE BY DIRECT REDUCTION AND MELTING OF IRON ORE

Magnus Gustav Georg Tiberg, Hallefors, Sweden, assignor to Aktiebolaget Svenska Kullagerfabriken, Gothenburg, Sweden

Continuation of Ser. No. 21,873, March 23, 1970, abandoned. This application July 19, 1972, Ser. No. 273,225
Claims priority, application Sweden, Mar. 26, 1969, 4267/69
Int. Cl. C21b 11/00, 11/10
U.S. Cl. 75—46 9 Claims

1. A method for the manufacture of steel from iron ore in a furnace plant including two furnace zones having arranged therebetween a connecting zone for transferring reducing gas, and which comprises:

A. generating a reduced gas in a first furnace zone;
B. said first furnace zone containing iron;
C. charging scrap iron into a second furnace zone;
D. continuously introducing finely dressed ore into said second furnace zone at the top of said second furnace zone;
E. passing said reducing gas into said second furnace zone and intimately contacting said reducing gas with said finely dressed ore to partially reduce said finely dressed ore;
F. then passing said reducing gas through the charge of scrap iron to remove fine particles of non-reduced iron ore entrained in said reducing gas and to bring particles of reduced iron to clad on the scrap iron charge;
G. said iron in said first furnace zone being prereduced finely dressed ore and scrap iron prepared by above steps (C) to (F);
H. melting and carrying out the final reduction of said iron in said first furnace zone;
I. reversing the functions of the furnace zones; and
J. repeating the process steps.

3,887,361

TREATMENT OF ORGANIC EFFLUENTS FROM THE HALCON PROCESS TO PRECIPITATE THE METAL USED AS CATALYST

Hans Lemke, Asnieres, France, assignor to Produits Chimiques Ugine Kuhlmann, Saint-Denis, France

Filed Feb. 15, 1973, Ser. No. 332,875
Claims priority, application France, Feb. 29, 1972, 72.06864
Int. Cl. C22b 3/00; C07d 1/08
U.S. Cl. 75—108 6 Claims

1. The process for treating the residual organic effluents derived from the process of epoxidation of olefins with hydroperoxides in the presence of a basic organic salt of molybdenum, tungsten, titanium, vanadium niobium or tantalum catalyst so as to precipitate the catalyst which comprises:

a. heating the effluents or distillation residues of the effluents with from about 5 to 50 percent by weight of tertiarybutyl alcohol to a temperature between about 100°C to 300°C in a closed vessel or under reflux; and
b. separating the resulting precipitate containing substantially all of the molybdenum, tungsten, titanium, vanadium, niobium or tantalum metal originally present in the effluent or distillation residues of the effluents.

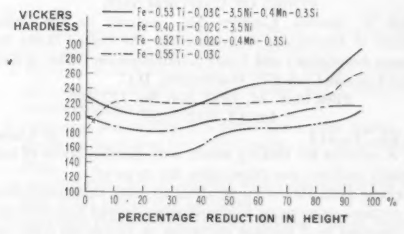
6. In the process for the epoxidation of olefins with hydroperoxides in the presence of a basic organic salt of molybdenum, tungsten, titanium, vanadium, niobium or tantalum catalyst, the improvement thereof comprising the treatment of the effluents or distillation residues of the effluents by the process of claim 1.

3,887,362

NITRIDABLE STEELS FOR COLD FLOW PROCESSES

Maria Ronay, Briarcliff Manor, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 18, 1972, Ser. No. 316,212
Int. Cl. C22c 37/00, 39/00
U.S. Cl. 75—123 K 1 Claim

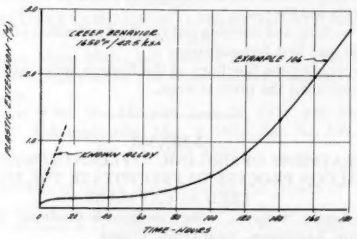


1. A steel alloy consisting essentially of 0.005 – 0.03 weight percent of carbon, 0.5 – 0.75 weight percent of titanium, 3.5 weight percent nickel, 0.3 weight percent of silicon, 0.4 weight percent manganese and the balance iron.

3,887,363
NICKEL-BASE SUPERALLOY CAST ARTICLE

Russell W. Smashey, Loveland, and Carl S. Wukusick, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 18, 1973, Ser. No. 426,092
Int. Cl. C22c *19/00*
U.S. Cl. 75—171 **8 Claims**



5. A cast Ni-base superalloy characterized by the substantial absence of NiAl, carbon, carbides and Ti and consisting, in atomic percent, essentially of 4–11 Cr, 5–16 Al, about 0.5–5 Re, up to about 10 V, up to about 15 Co, up to about 5 Ta, up to about 5 W, up to about 1 Mo, up to about 2.5 Mn, up to about 2.5 Rh, with the balance essentially nickel and incidental impurities.

3,887,364
SUPERCONDUCTING MATERIALS

Ushio Kawabe; Mitsuhiro Kudo; Shigeo Fukase, and Masato Ishibashi, all of Tokyo, Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 1, 1972, Ser. No. 311,148
Claims priority, application Japan, Dec. 1, 1971, 46-96271
Int. Cl. C22c *27/00;* **H01f** *1/04*
U.S. Cl. 75—174 **14 Claims**

1. A superconducting material having high critical temperature, said material being an alloy represented by the formula: Nb-Al-M, wherein M is an element selected from the group consisting of 0.05–3.8 atomic percent of Te, 0.05–2.4 atomic percent of Y, 3.2–4.2 atomic percent of Y, 0.05–3.2 atomic percent of Ce, 0.05–2.7 atomic percent of Pr, 0.05–2.7 atomic percent of Eu, 0.05–2.1 atomic percent of Ca and 0.05–7.2 atomic percent of Zn, wherein the amount of Nb is in a range of 74–80 atomic percent and the balance of said alloy is Al and very minor amounts of unavoidable impurities.

3,887,365
PROCESS FOR MAKING SHEETS WITH PARALLEL PORES OF UNIFORM SIZE

Joseph M. Sherfey, Lanham, Md., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Mar. 24, 1971, Ser. No. 127,480
Int. Cl. B22f *5/00*
U.S. Cl. 75—214 **25 Claims**

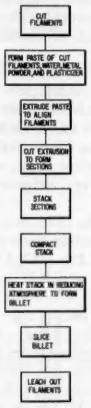
1. A process for making sheets with parallel pores of substantially uniform size comprising the steps of:

forming a plurality of longitudinal sections, said longitudinal sections comprising longitudinally arrayed filaments surrounded by a mixture including, in powdered form, the material of which said sheets are to be formed;

stacking said plurality of longitudinal sections with their lingitudinal axes substantially in parallel;

forming a billet of said plurality of stacked longitudinal sections;

slicing, to a predetermined sheet thickness, said billet at right angles to the longitudinal axes of the plurality of longitudinal sections making up said billet to form a sheet; and


CUT FILAMENTS
FORM PASTE OF CUT FILAMENTS, WATER, METAL POWDER, AND PLASTICIZER
EXTRUDE PASTE TO ALIGN FILAMENTS
CUT EXTRUSION TO FORM SECTIONS
STACK SECTIONS
COMPACT STACK
HEAT STACK IN REDUCING ATMOSPHERE TO FORM BILLET
SLICE BILLET
LEACH OUT FILAMENTS

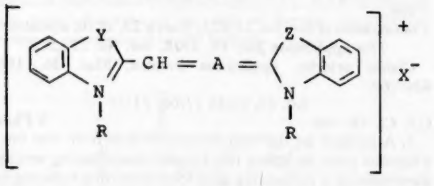
removing said longitudinally arrayed filaments from the sheet.

3,887,366
CYANINE PIGMENTS IN ELECTROPHOTOGRAPHIC PROCESSES

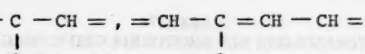
Robert Bruce Champ, and Meredith David Shattuck, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 30, 1971, Ser. No. 129,637
Int. Cl. G03g *5/06*
U.S. Cl. 96—1 PC **8 Claims**

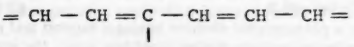
1. In an electrophotographic reproduction process which comprises selectively rendering portions of a photoconductor electrically conductive by selective exposure to light, the improvement according to which the photoconductor comprises polymolecular aggregates less than five microns in size of a pigment having the formula:



wherein R is selected from the group consisting of methyl, ethyl and allyl, X is selected from the group consisting of the chloride, bromide and iodide ions, Y and Z are each selected from the group consisting of O, S and Se, and A is selected from the group consisting of hydrocarbon chains having the formula



and



wherein Q is selected from H, CH_3 and C_2H_5.

3,887,367

METHOD FOR TEMPERATURE STABILIZING PHOTORECEPTORS

Delmer Gene Parker, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 26, 1973, Ser. No. 427,967
Int. Cl. G03g *17/00*
U.S. Cl. 96—1 R **6 Claims**

1. A method for controlling photoreceptor fatigue effects in selenium-arsenic-containing xerographic photoreceptors evidenced by variations in charging level, poor image resolution and deletions due to high dark discharge rates, the improvement comprising heating and maintaining the photoreceptor at about constant temperature at a point within the range of about 10 percent – 30 percent above ambient conditions and no higher than about 40°C.

3,887,368

COMPOSITION

John C. Schottmiller, Penfield; Francis W. Ryan, Pittsford, both of N.Y., and Charles Wood, Sycamore, Ill., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 798,750, Feb. 12, 1969, abandoned, which is a continuation-in-part of Ser. No. 674,267, Oct. 10, 1967, Pat. No. 3,627,573, which is a continuation-in-part of Ser. No. 550,215, May 16, 1966, abandoned. This application July 23, 1973, Ser. No. 381,643
Int. Cl. G03g *5/02*
U.S. Cl. 96—1.5 **3 Claims**

1. A xerographic member having a single photoconductive layer which is contained on a supporting electrically conductive substrate, said layer comprising a vitreous selenium-bismuth composition with the bismuth comprising about 0.5 to 2.0 atomic percent, with the balance substantially selenium.

3,887,369

ORGANIC PHOTOCONDUCTIVE ELEMENT WITH INTERLAYER AND ADHESION PROMOTING ADDITIVE

Hiroshi Matsuno, and Ichiro Endo, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1973, Ser. No. 412,828
Claims priority, application Japan, Nov. 6, 1972, 47-110942
Int. Cl. G03q *5/06*
U.S. Cl. 96—1.5 **15 Claims**

1. An electrophotographic photosensitive member comprising a support; and overlying said support an intermediate barrier layer having a thickness of less than 10 microns for preventing electric deterioration and fatigue due to repeated use, said intermediate barrier layer consisting essentially of (1) a copolymer of maleic anhydride and an alkyl vinyl ether wherein the alkyl moiety thereof has from 1 to 12 carbon atoms or (2) mixtures of (a) copolymers of alkyl vinyl ethers wherein the alkyl moiety thereof has from 1 to 12 carbon atoms and alkyl half esters of maleic acid and (b) homopolymers of vinyl pyrrolidone having an average molecular weight of from 4,000 to 360,000 or copolymers of vinyl pyrrolidone with vinyl monomers copolymerizable therewith having an average molecular weight of from 4,000 to 360,000; and overlying said intermediate barrier layer a photoconductive layer consisting essentially of an organic photoconductor and from 1 to 10% by weight, based on the weight of the organic photoconductor, of a copolymer of vinylidene chloride and an acrylic acid alkyl ester.

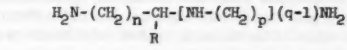
3,887,370

DYE TRANSFER ACCELERATION WITH POLYAMINE COMPOUNDS

Yasushi Ohyama, and Hideo Sumitani, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Jan. 3, 1973, Ser. No. 320,822
Claims priority, application Japan, Jan. 7, 1972, 47-4528
Int. Cl. G03c *5/54, 7/00, 5/30, 1/40*
U.S. Cl. 96—29 D **7 Claims**

1. In a color development dye transfer method in which a color photograph is obtained quickly by using a dye transfer color photographic material comprising a portion composed mainly of a photosensitive silver halide emulsion layer containing a non-diffusible coupler capable of splitting off a diffusible anionic dye by coupling, in combination with a portion composed mainly of a dye transfer layer containing a cationic higher polymer mordanting agent layer capable of fixing therein the diffused anionic dye, subjecting the photographic material to exposure and color development to fix in the dye transfer layer the anionic dye splitted off by the coupling reaction, and then removing the unnecessary photosensitive emulsion layer portion therein by leaving the dye transfer layer in which a desired color image is formed, the improvement which comprises accelerating the dye transfer rate of color development by affecting dye transfer in the presence of a mixture of an alcohol and at least one of polymethylenepolyamine derivative having the general formula,



wherein R is a hydrogen atom or a lower alkyl group; and *n*, *p* and *q* are individually a positive integer of from 1 to 9, 2 to 4, and 1 to 4, respectively without directly introducing said polymethylenepolyamine derivative directly into said silver halide emulsion layer.

3,887,371

PHOTOGRAPHIC METHOD FOR PRINTING VIEWING-SCREEN STRUCTURE INCLUDING TREATMENT OF EXPOSED COATING WITH AMMONIUM COMPOUND

Ratib Sofar Baker, Kinzer, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 10, 1973, Ser. No. 423,474
Int. Cl. G03c *5/00*
U.S. Cl. 96—36.1 **10 Claims**

1. A photographic method for printing a viewing-screen structure upon a supporting surface comprising:

a. applying to said supporting surface a coating comprised of a dichromatizable organic binder and a dichromate photosensitizer for said binder,

b. exposing said coating to a pattern of actinic energy, said exposure including both heat energy and ultraviolet energy,

c. wetting said exposed coating with a dilute aqueous solution of an ammonium compound,

d. and then flushing said exposed coating with an aqueous solvent to remove the more-soluble portions of the coating and those less-soluble portions of said coating that have been exposed solely to heat energy, while retaining in place the less-soluble portions of said coating that have been exposed to ultraviolet energy.

3,887,372

PHOTOGRAPHIC ELEMENTS AND PROCESSES FOR PRODUCING FORMAZAN DYE IMAGES OF ENHANCED STABILITY

David S. Bailey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 2, 1973, Ser. No. 384,858
Int. Cl. G03c 5/24, 1/52
U.S. Cl. 96—48 R 70 Claims

1. In a photographic element having a support and at least one radiation-sensitive image recording layer thereon comprised of a source of labile hydrogen atoms, a tetrazolium salt capable of reduction to a formazan dye and a photoreductant capable of forming a base activatible reducing agent precursor on exposure to actinic radiation in the presence of said labile hydrogen atoms, the improvement in which said tetrazolium salt includes dye stabilizing tetrazole nucleus substituents which are, collectively, predominantly electronegative so that the algebraic sum of the Hammett sigma values of the tetrazole nucleus substituents are

a. in excess of 0.78 or

b. in excess of 0.40 when said tetrazole nucleus is provided with a ring substituent bonded to said tetrazole nucleus at a first ring position and including a single substituent ortho to said first ring position.

65. An image recording process comprising converting a photoreductant capable of forming a base activatible reducing agent precursor on exposure to actinic radiation, within a selected areal portion of a radiation-sensitive layer of a photographic element, to a reducing agent precursor by imagewise exposing the photoreductant to actinic radiation while in reactive contact with labile hydrogen atoms,

activating the precursor with a base to form a reducing agent; and

reducing to produce a formazan dye of enhanced stability a tetrazolium salt including dye stabilizing tetrazole nucleus substituents which are, collectively, predominantly electronegative so that the algebraic sum of the Hammett sigma values of the tetrazole nucleus substituents are

a. in excess of 0.78 or

b. in excess of 0.40 when the tetrazole nucleus is provided with a ring substituent bonded to the tetrazole nucleus at a first ring position and including a single substituent ortho to the first ring position.

3,887,373

NON-POLLUTING PHOTORESIST DEVELOPING PROCESS

Robert G. Hays, Scottsdale; Henry G. Hughes, Phoenix, and William L. Hunter, Scottsdale, all of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Division of Ser. No. 350,246, April 11, 1973. This application Dec. 12, 1973, Ser. No. 424,138
Int. Cl. G03f 7/08
U.S. Cl. 96—36 3 Claims

1. A process for developing a cyclized polyisoprene photoresist composition coated on a substrate after imagewise exposure which comprises applying a saturated hydrocarbon naphtha or cyclohexane solvent to the unexposed portions of said photoresist coating to remove the unexposed portions while allowing the exposed portions to remain on said substrate said composition comprising a cyclized polyisoprene containing double bonds and 2,6-bis(p-azido benzylidene)-4-methylcyclohexanone as a sensitizer.

3,887,374

TETRAZOLIUM ALT PHOTOREDUCTIVE IMAGING

Ralph T. Brongo; James C. Fleming, and Joseph W. Manthey, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 2, 1973, Ser. No. 384,859
Int. Cl. G03c 5/24, 1/52
U.S. Cl. 96—48 R 67 Claims

1. In a photographic element having a support and at least one radiation-sensitive image recording layer, the improvement in which said image recording layer is comprised of a source of labile hydrogen atoms, a tetrazolium salt capable of reduction to a formazan dye and a photo-reductant capable of producing a base activatible reducing agent precursor on exposure to actinic radiation in the presence of said labile hydrogen atoms.

3,887,375

RESTRAINERS FOR RAPID ACCESS, AIR STABLE, REGENERABLE, METAL CHELATE DEVELOPER SOLUTIONS

Norman Newman, and Richard S. Fisch, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 24, 1973, Ser. No. 391,510
Int. Cl. G03c 5/30
U.S. Cl. 96—66.5 14 Claims

1. A rapid access, air-stable, regenerable metal chelate developer solution, the metal chelate selected from the group consisting of iron, titanium, and vanadium chelate developers, including therein as fog restrainer halide and a compound selected from the group consiting of 2-mercaptobenzothiazole L-thiazolidine-4-carboxylic acid, and N-methylbenzothiazolium p-toluene sulphonate.

2. The developer solution of claim 1 wherein the metal chelate developer solution comprises an aqueous solution of a metal chelate developer and at least one developer selected from gallic acid, tannic acid, amidol and 2,5-di-tert-butyl hydroquinone.

3,887,376

PHOTOGRAPHIC ELEMENTS, COMPOSITIONS AND PROCESSES

Burton D. Wilson; Paul E. Woodgate, both of Rochester, and Richard W. Henn, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 252,036, May 10, 1972, abandoned. This application June 13, 1974, Ser. No. 479,024
Int. Cl. G03c 5/26, 5/30
U.S. Cl. 96—66 R 4 Claims

1. A photographic processing composition comprising an alkaline development activator and an N-hydroxyurea silver halide developing agent, said N-hydroxyurea silver halide developing agent being represented by the formula:

wherein R^1 is hydrogen, alkyl containing 1 to 4 carbon atoms or aryl containing 6 to 10 carbon atoms; R^2 is hydrogen, alkyl containing 1 to 4 carbon atoms or aryl containing 6 to 10 carbon atoms; R^3 is hydrogen, alkyl containing 1 to 4 carbon atoms or aryl containing 6 to 10 carbon atoms.

3,887,377
ANTISTATIC PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Nobuo Yamamoto; Masakazu Yoneyama; Wataru Ueno, and Takayuki Inayama, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

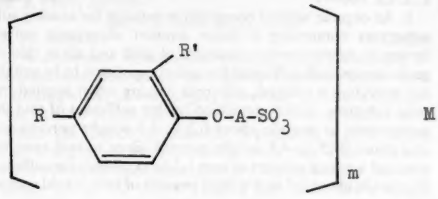
Filed July 19, 1973, Ser. No. 380,795

Claims priority, application Japan, July 22, 1972, 47-73542; Oct. 24, 1972, 47-106487

Int. Cl. G03c *1/82*

U.S. Cl. 96—87 A **11 Claims**

1. An antistatic photographic light-sensitive material having thereon a surface layer comprising a non-gelatin containing binder and an antistatic compound represented by the following general formula:



wherein R and R′, which may be the same or different, each represents an aliphatic hydrocarbon residue having 1–22 carbon atoms, the sum of carbon atoms or R and R′ being 6–40, A represents a divalent aliphatic hydrocarbon residue having 4–8 carbon atoms in total, M represents a hydrogen atom, a metal atom or a quaternary ammonium salt, and m represents a number corresponding to the valence of M.

3,887,378
IMAGE RECORDING AND RECEIVING MATERIALS

Alfons Klein, Dusseldorf; Anita Von Konig, Leverkusen, both of Germany; Albert Lucien Poot, Kontich, Belgium, and Karlfried Wedemeyer, Cologne-Stammheim, Germany, assignors to Agfa-Gevaert, Mortsel, Belgium

Filed Apr. 12, 1974, Ser. No. 460,534

Claims priority, application Germany, Apr. 16, 1973, 2319080

Int. Cl. G03c *1/02*

U.S. Cl. 96—114.1 **18 Claims**

1. An image reproduction material selected from the group consisting of a recording material and an image-receiving material comprising a layer which contains a substantially light-insensitive silver salt, a reducing agent and a toner, characterized in that it contains a hydroxyindane as reducing agent.

3,887,379
PHOTORESIST AZIDE SENSITIZER COMPOSITION

Nicholas J. Clecak, San Jose, and Robert J. Cox, Los Gatos, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 239,794, March 30, 1972, abandoned. This application Aug. 15, 1973, Ser. No. 388,706

Int. Cl. G03f *7/08*; **G03c** *1/72*

U.S. Cl. 96—115 R **5 Claims**

1. A negative resist composition comprising a poly-(2-chlor-1,3-butadiene) and in an amount of from 0.5 to 10 percent by weight of the weight of the photosensitive polymer, a photosensitizer selected from the group consisting of 6-Azido-2-(4-p-dimethylaminophenyl-2,4-butadienyl(-N-methylbenzenthiazolium iodide, 6-Azido-3-methyl-2-3-[3-(6-azido-3-methylbenzothiazolylidene) propene]benzothiazolium iodide, 6-Azido-3-methyl-2-(p-dimethylaminostyryl) benzenethiazolium iodide, and N-Methyl-4-(6-azido-3-methyl-2-benzenethiazolylidenemethylene) quinolinium iodide.

3,887,380
DIRECT POSITIVE SILVER HALIDE PHOTOGRAPHIC EMULSION

Keisuke Shiba; Masanao Hinata; Reiichi Ohi; Arkira Sato; Koutarou Yamasue, all of Minami-Ashigara, Japan, and Tokiharu Kondo, deceased, late of Minami-Ashigara, Japan (by Yoshiharu Kondo, legal representative), assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan,

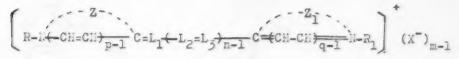
Continuation-in-part of Ser. No. 149,272, June 2, 1971, abandoned. This application Aug. 21, 1973, Ser. No. 390,264

Claims priority, application Japan, June 2, 1970, 45-47380; June 2, 1971, 46-18670; Germany, June 2, 1971, 2127346; France, June 2, 1971, 71.19938; Canada, June 2, 1971, 114642; Belgium, June 2, 1971, 104148

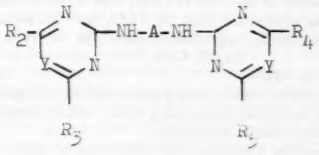
Int. Cl. G03c *1/14*

U.S. Cl. 96—126 **15 Claims**

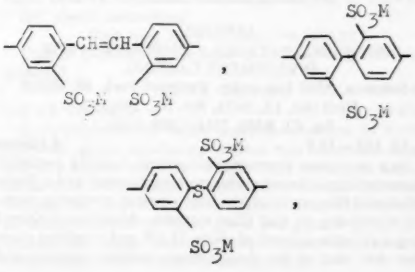
1. A direct positive silver halide photographic emulsion comprising fogged silver halide and a combination of at least a sensitizing halogen accepting cyanine dye represented by the formula (I)

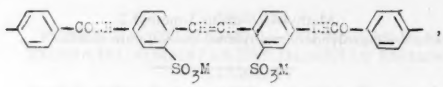


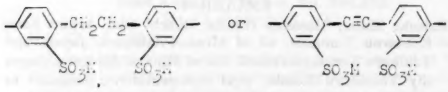
wherein Z and Z_1 each represents non-metal atoms necessary to complete a thiazole nucleus, an oxazle nucleus, a selenazole nucleus, a thiazoline nucleus, an oxazoline nucleus, a quinoline nucleus, an isoquinoline nucleus, a benzimidazole nucleus, or a 3,3′-dialkylindolenine nucleus, R and R_1 each represents an alkyl group or an aryl group, L_1, L_2 and L_3 each represents a methine group, p and q each represents 1 or 2, n represents 1, 2 or 3, m represents 1 or 2, and X represents an anion, together with at least a compound represented by the following formula (II)



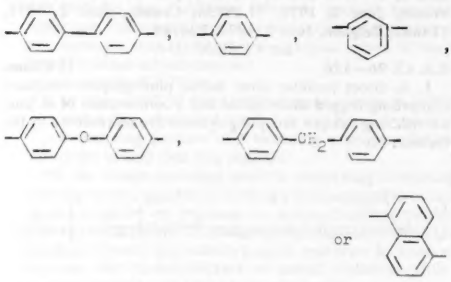
wherein Y represents =CH— or =N—; R_2, R_3, R_4 and R_5 each represents a hydrogen atom, a hydroxy group, an alkoxy group, an aryloxy group, a halogen atom, a heterocyclic nucleus, an alkylthio group, heteracryclothia group an arylthio group, an amino group, an alkylamino group, arylamins group a heterocycloamino group, an aryl group or a mercapto group; and —A— represents $—A_1—$ or $—A_2—$, wherein $—A_1—$ is







wherein M represents a hydrogen atom or a cation which affords water solubility, and wherein $-A_2-$ is



with the proviso that when $-A-$ represents $-A_2-$, at least one of R_2, R_3, R_4 and R_5 is a substitutent containing a $-SO_3M$ group, in which M is as described above.

3,887,381

SPECTRAL SENSITIZATION OF PHOTOGRAPHIC LIGHT-SENSITIVE EMULSION

Keisuke Shiba, and Motohiko Tsubota, both of Minami-Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Continuation of Ser. No. 111,501, Feb. 1, 1971, abandoned. This application Mar. 30, 1973, Ser. No. 346,386

Claims priority, application Japan, Jan. 30, 1970, 45-8231

Int. Cl. G03c *1/10, 1/18*

U.S. Cl. 96—127 **28 Claims**

1. A method for sensitizing spectrally, a photographic light sensitive emulsion, comprising silver halide dispersed in a hydrophilic colloid comprising

a. dissolving a methine dye containing at least one water-soluble group in an organic solvent having a water solubility of 10% by weight or less at 35°C,

b. dispersing the solution in a member selected from the group consisting of water and a hydrophilic colloid of 2% by weight or less, and

c. subsequently to the dispersing step, adding the dispersion to the light-sensitive silver halide emulsion.

3,887,382

DISPOSABLE PATTERN, COMPOSITION FOR INVESTMENT CASTING

Paul Solomon, 3500 University, Highland Park, Ill. 60035

Filed Oct. 13, 1972, Ser. No. 297,352

Int. Cl. B28b *7/34;* **C08h** *9/06*

U.S. Cl. 106—38.8 **4 Claims**

1. In a two-phase thermoplastic pattern forming composition comprising a thermoplastic pattern material and a finely divided solid filler material, the improvement consisting essentially of utilizing, as said filler material, decachlorobiphenyl having a chlorine content of about 71.5% and a melting point higher than that of the thermoplastic pattern material and present in an amount from about 5% to about 70% by volume of the pattern forming composition.

3,887,383

GOLD CONTAINING COMPOSITIONS FOR PRODUCING LUSTER FILMS ON SOLID SUBSTRATES

Edward P. Nesteruk, Somerset, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Murray Hill, N.J.

Division of Ser. No. 193,547, Oct. 28, 1971, Pat. No. 3,811,925. This application Mar. 7, 1974, Ser. No. 449,056

Int. Cl. C23r *3/00*

U.S. Cl. 106—1 **18 Claims**

1. An organic solvent composition suitable for coating solid substrates comprising a major amount of organic solvent having in solution minor amounts of gold and silver thio organic compounds sufficient for said composition to be suitable for providing a colored, adherent coating when applied to a solid substrate, said composition having sufficient of said thio compounds to provide about 0.2 to 4.5 weight percent gold and about 0.05 to 4.5 weight percent silver in said composition and a minor amount of iron 1,3-beta diketonate sufficient to provide about 0.5 to 8 weight percent of iron in said composition.

3,887,384

TOUGH REFRACTORY OXIDE EUTECTIC ARTICLE

Charles O. Hulse, South Glastonbury, and John A. Batt, Ellington, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Feb. 27, 1974, Ser. No. 446,578

Int. Cl. C04b *35/48*

U.S. Cl. 106—57 **2 Claims**

1. A directionally solidified refractory oxide composite article comprising a matrix phase consisting essentially of a compound of calcium oxide and zirconium oxide and a reinforcing phase consisting essentially of zirconium oxide embedded therein in the form of lamellae substantially oriented in the direction of principal anticipated stress.

3,887,385

DRY LIGHT-WEIGHT CEMENT COMPOSITION

Bernardus B. Quist, Amsterdam, and Jacobus J. M. Zuiderwijk, Rijswijk, both of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 9, 1974, Ser. No. 468,306

Claims priority, application Netherlands, May 17, 1973, 7306868

Int. Cl. C04b *7/02*

U.S. Cl. 106—96 **8 Claims**

1. A dry light-weight cement composition for use in an underground borehole, which composition comprises a mixture of cement, bituminous particles which are precipitated from a residual crude oil fraction and aluminum silicate particles, in which mixture more than 90% by weight of the bituminous particles are smaller than 700 microns, more than 90% by weight of the particles of the aluminum silicate are smaller than 30 microns, and from about 0.5 – 2.0 parts of weight of cement and less than about 0.2 part by weight of aluminum silicate are present per 1 part by weight of bitumen.

3,887,386
GLASS FIBRES AND COMPOSITIONS CONTAINING GLASS FIBRES

Amalendu Jyoti Majumdar, Watford, England, assignor to National Research and Development Corporation, London, England

Division of Ser. No. 127,361, March 23, 1971, Pat. No. 3,783,092, which is a continuation-in-part of Ser. No. 649,463, June 28, 1967, abandoned, and a continuation-in-part of Ser. No. 748,645, July 30, 1968, abandoned, and a continuation-in-part of Ser. No. 31,184, March 26, 1970, abandoned. This application July 24, 1973, Ser. No. 382,173. The portion of the term of this patent subsequent to Jan. 1, 1991, has been disclaimed.

Claims priority, application United Kingdom, Apr. 3, 1969, 17448/69; Aug. 4, 1967, 35901/67; July 11, 1966, 31025/66; Feb. 2, 1967, 5070/67

Int. Cl. C04b *18/22, 31/06*

U.S. Cl. 106—99 **16 Claims**

1. A composite fibre/cementitious product comprising fibrous material distributed throughout a cement matrix as a reinforcing material and subject where the surface is exposed to the cement matrix, to the corrosive action of said matrix, in which the reinforcing material is primarily a glass having per se a degree of alkali-resistance such that when tested in the form of an abraded fibre of length 2½ inches and diameter of from 0.4 to 1.0 $\times 10^{-3}$ inches said fibre has a tensile strength of at least 100,000 p.s.i. after treatment with saturated aqueous $Ca(OH)_2$ solution at 100°C for 4 hours followed by successive washings at ambient temperature with water, then with aqueous hydrochloric acid (1%) for 1 minute, water, acetone, followed by drying, said fibre experiencing not more than 10% reduction in diameter during said test.

3,887,387
SHAPED ZIRCONIUM OXIDE BODIES OF HIGH STRENGTH

Hans Sturhahn, Esslingen-Liebesbronn, Germany, assignor to Feldmuhle Anlagen- und Produktions- Gesellschaft mit beschrankter Haftung, Oberkassel, Germany

Filed Feb. 11, 1974, Ser. No. 441,646

Int. Cl. C04b *35/48*

Claims priority, application Germany, Feb. 16, 1973, 2307666

U.S. Cl. 106—57 **13 Claims**

1. A shaped body essentially consisting of sintered polycrystalline zirconium oxide and 2.5% to 3.5% of at least one oxide of the group consisting of oxides of magnesium, calcium, rare earth metal, cadmium, manganese, cobalt, and titanium, 75% to 95% of said body consisting of cubic crystals, said body having a density greater than 5.5 g/cm³, and the material of said body having a flexural strength of at least 30 kp/mm², all percent values being by weight.

3,887,388
CEMENT MANUFACTURE

Soren Bent Christiansen, Copenhagen Valby, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed July 2, 1973, Ser. No. 375,372

Claims priority, application United Kingdom, July 10, 1972, 32232/72

Int. Cl. C04b *7/44*

U.S. Cl. 106—100 **34 Claims**

1. A method of removing at least a portion of gaseous compounds containing at least one of alkali, chlorine and sulphur from the exit gases of a rotary kiln in which cement raw meal is burnt to cement clinker with a view to subsequent cement manufacture comprising the steps of dividing the hot exit gases from the rotary kiln into a main gas flow and a separate divisional flow; directing the main gas flow through a suspension preheater for preheating cement raw meal prior to feeding the raw meal into the kiln; directing a plurality of individual relatively cool generally spherical solid condensation bodies of at least one of iron and ceramic material to pass through said divisional flow substantially under the influence of gravity in a manner which permits direct contact between said hot exit gas of said divisional flow and said bodies such that gaseous compounds containing at least one of alkali, chlorine and sulphur are condensed to form a coating on at least a portion of the surface of said bodies; removing said condensation bodies from said divisional gas flow; removing at least a portion of said condensed gaseous compounds from said condensation bodies; and redirecting said bodies into said divisional gas flow for the continuous removal of the gaseous compounds from the exit gases of said kiln.

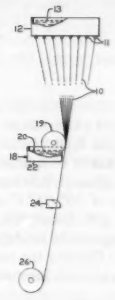
3,887,389
FIBER GLASS SIZING FOR USE IN TIRE CORD MANUFACTURING

Jerry C. Hedden, Shelby, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 26, 1973, Ser. No. 326,740

Int. Cl. C08b *27/60, 27/58*

U.S. Cl. 106—212 **4 Claims**



1. A glass fiber forming size, useful for sizing glass fibers which reinforce elastomers to provide improved flex fatigue resistance, consisting essentially of: an aqueous starch mixture consisting essentially of; 45 to 55 percent by weight of a high amylose starch component having an amylose content of about 50 to about 60 percent by weight, and 45 to 55 percent by weight of a water-repellent low amylose starch component having crosslinks therein, having an amylose content of about 20 to 30 percent by weight; 0.5 to 3 percent by weight of a member of the group consisting of a paraffin wax and a microcrystalline wax; 0.4 to 1% by weight of a silane coupling agent; and about 0.75 to 1.25 percent by weight of a non-ionic wetting agent.

3,887,390
CONCENTRATED STABLE AQUEOUS EMULSIONS OF WATER-REPELLENT AGENTS AND PROCESS FOR MAKING THEM

Hans Deiner, Hainhofen, Germany, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Aug. 13, 1973, Ser. No. 387,877

Claims priority, application Germany, Aug. 18, 1972, 2240597

Int. Cl. C08h *9/06*

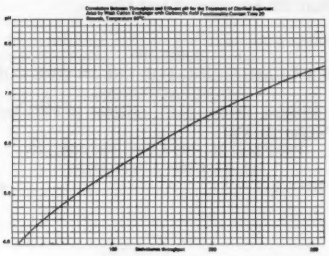
U.S. Cl. 106—271 **18 Claims**

1. A concentrated stable aqueous emulsion of a water-repellent agent comprising a Werner type chromium complex salt of a higher molecular weight fatty carboxylic acid, the molar ratio of chromium to fatty acid present in the emulsion being in the range of 1:0.55 to 1:2, and emulsified paraffin in an amount of 800 to 4,000 grams per g-atom of chromium, wherein the solids content of the emulsion is greater than 15%, based on the weight of the emulsion.

3,887,391
PROCESS FOR THE DECALCIFICATION SUGAR BEET JUICE

Karlheinz W. R. Schoenrock; Preston Richey, and Hugh G. Rounds, all of Ogden, Utah, assignors to The Amalgamated Sugar Company, Ogden, Utah

Filed Feb. 19, 1974, Ser. No. 443,612
Int. Cl. C13d *3/02, 3/14*
U.S. Cl. 127—46 A 5 Claims



1. A process which comprises the steps of (a) treating sugar beet juice, after second carbonation, with the hydrogen form of a resinous carboxylic type cation exchanger arranged in a column for the reduction of calcium ion in the juice, at a flowrate of between 20 and 200 resin bedvolumes per hour and at a temperature of 70°–95° C and for a contact time of between 20 seconds and 3 minutes; (b) realkalizing the so-treated juice with magnesium oxide to a pH between 7.5 and 9.5 and thereafter (c) filtering the realkalized juice to remove excess magnesium oxide and insoluble impurities.

3,887,392
MATERIAL TREATMENT METHOD

Arthur Y. C. Tang, Framingham, Mass., assignor to General Diode Corporation, Framingham, Mass.

Filed Nov. 23, 1973, Ser. No. 418,369
Int. Cl. B08b *7/00*
U.S. Cl. 134—1 3 Claims

1. A method of cleaning a material substrate, having impurities which are capable of being dissolved in and co-vaporized with solvent on the application thereto of microwave energy, the method consisting essentially of: providing a porous carrier sheet; impregnating said carrier sheet with said solvent; positioning said impregnated carrier sheet in contact with said material substrate; applying microwave energy to said impregnated carrier sheet so as to generate heat therein and thereby vaporize said impurities and said solvent and remove the same from said material substrate.

3,887,393
BATTERY HOLDER ASSEMBLY

Mervin W. La Rue, Jr., Barrington, Ill., assignor to Bell & Howell Company, Chicago, Ill.

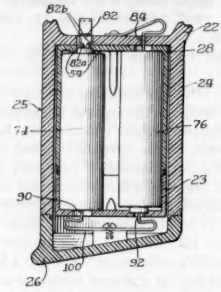
Filed Dec. 15, 1972, Ser. No. 315,387
Int. Cl. H01m *1/00*
U.S. Cl. 136—173 4 Claims

1. A battery holding assembly for elongate battery cells of the type having a central protruding positive terminal at one end and a negative terminal surface at the opposite end, said assembly comprising:

an elongate cassette for receiving and retaining a predetermined number of said battery cells in a side-by-side assembled relationship, said cassette comprising a first portion and a detachable second portion with one end wall formed as a part of said first portion and an opposite end wall formed as a part of said second portion, said first portion being attachable to said second portion in only two possible 180° rotated orientations;

means projecting longitudinally within said cassette for defining a longitudinal compartment for each of said predetermined number of batter cells, said cassette end walls providing for each battery cell compartment a pair of aligned contact-receiving apertures, a first one of said pair of aligned contact-receiving apertures having a minor diameter and a second one of said pair of contact receiving apertures having a major diameter larger than said minor diameter;

spacer means providing a raised surface region on the interior surface of each of said end walls adjacent the first one of each of said pair of aligned apertures and configured



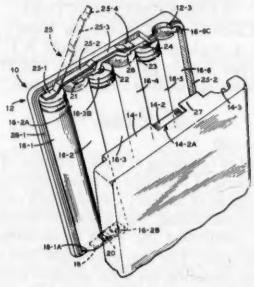
to form a socket for receiving the protruding positive battery terminal only, whereby electrical contact may be prevented with the negative terminal of a battery cell should the battery cell be improperly inserted in said cassette in reversed polarity orientation; and

a receiver housing for longitudinally receiving said cassette, said receiver housing having a pair of end walls each including a predetermined number of inwardly protruding electrical contact elements positioned to enter said contact-receiving apertures of said cassette for establishing electrical contact with said battery cells when said battery cells are properly oriented in said cassette, said electrical contact elements including a negative electrical contact element having a dimension larger than the minor diameter and smaller than the major diameter.

3,887,394
BATTERY CARTRIDGE WITH HOLLOW CASE OF MINIMUM WEIGHT AND DIMENSIONS

Gordon E. Kaye, Garrison, N.Y., assignor to P. R. Mallory & Co. Incorporated, Indianapolis, Ind.

Filed Sept. 4, 1973, Ser. No. 394,031
Int. Cl. H01m *1/02*
U.S. Cl. 136—173 14 Claims



1. A battery for use with a portable apparatus, comprising a plurality of cells electrically connected in predetermined

electrical relation, and providing two electrode terminals of the battery;

a case for said cells, consisting of a hollow shell of two cofitting and mating parts having their internal surfaces shaped to fittingly engage and hold said cells in place;

said case having two windows for access from outside the case to said two electrode terminals of said battery, within said case, for engagement by two external circuit electrode terminals correspondingly positioned on an external apparatus to be serviced by said battery;

and means on said case to cooperate with a predesigned element of said apparatus for requiring the case to be properly positioned and also preventing the case from being improperly positioned in movement to its operating position relative to said apparatus, to assure proper engagement of said internal battery electrode terminals and said external circuit electrode terminals, whereby proper circuit connections will be made between said battery and the circuitry of said apparatus when the battery case is inserted to its operating position on said apparatus.

3,887,395
COBALT-RARE EARTH MAGNETS COMPRISING SINTERED PRODUCTS BONDED WITH COBALT-RARE EARTH BONDING AGENTS

Donald L. Martin, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 7, 1974, Ser. No. 431,127
Int. Cl. H01f *1/04*
U.S. Cl. 148—31.57 **4 Claims**

1. A cobalt-rare earth alloy permanent magnet having an area greater than 4 square inches and substantially uniform permanent magnet properties throughout, said magnet consisting essentially of at least two sintered products bonded together by a magnetic bonding agent, each said sintered product consisting essentially of compacted particulate cobalt-rare earth permanent magnet alloy having pores which are substantially non-interconnecting and a density of at least 87%, said magnet being produced by depositing a layer of particles ranging in size up to 10 microns of a magnetic solid bonding agent on the bonding surface of one of said sintered products, said agent consisting essentially of cobalt-rare earth alloy containing the rare earth component in an amount at least 10 atom % greater than that of the alloy of the sintered products being bonded with the maximum amount of rare earth component being 80 atom % with at least 1% by volume of said agent passing through a liquid phase at an elevated temperature ranging up to 1,250°C, contacting the bonding surface of the second sintered product with said deposited bonding agent substantially coextensively therewith, and heating the resulting assembly in an atmosphere in which it is substantially inert to a temperature at which said bonding agent passes through said liquid phase and ranging from 900° to 1,250°C to bond said sintered products producing a solid bonded sintered product.

3,887,396
MODULAR ELECTROCHEMICAL CELL

William J. Walsh, Naperville; Albert A. Chilenskas, Western Springs, both of Ill.; Elton J. Cairns, Troy, Mich., and Paul A. Nelson, Wheaton, Ill., assignors to The United States Energy Research and Development Administration, Washington, D.C.

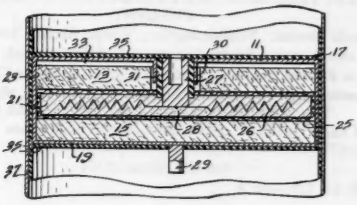
Filed Nov. 15, 1973, Ser. No. 416,311
Int. Cl. H01m *43/00*
U.S. Cl. 136—6 L **8 Claims**

1. A modular, secondary electrochemical cell including an anode containing an alkali metal reactant, a cathode containing a chalcogen and a molten electrolyte including ions of said alkali metal, the improvement comprising:

a hollow housing having a small height relative to breadth;

first and second anode structures adjacent to the inner end surfaces of said housing and in electrical contact with said housing, said anode structures including a porous, solid substrate with said alkali metal reactant within the interstices of said substrate;

a cathode structure disposed between said anode structures, said cathode structure comprising a porous, mass during operation of said cell;



a porous layer of electrically insulative material immersed in said electrolyte intermediate said cathode and anode structures for preventing direct anode to cathode contact; and

first and second electrical terminals in coaxial alignment with said housing at the upper and lower end surfaces thereof.

3,887,397
HIGHLY CONDUCTIVE STABLE ELECTROLYTE FOR LITHIUM BATTERIES

Robert J. Horning, Sellersville, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 2, 1974, Ser. No. 430,027
Int. Cl. H01m *17/02, 43/06*
U.S. Cl. 136—6 LN **3 Claims**

1. In a current producing cell having a Lithium anode, an electrolyte of methyl formate having $LiAsF_6$ dissolved therein and a cathode inert to said electrolyte, the improvement comprising:

a minor portion of $LiBF_4$ dissolved in said methyl formate.

3,887,398
PREVENTION OF DETERIORATION OF LEAD DIOXIDE

David Singman, Rockville, Md., assignor to United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 28, 1973, Ser. No. 419,821
Int. Cl. H01m *35/00*
U.S. Cl. 136—26 **8 Claims**

1. An electrode for an electrical cell comprising a base plate having a layer of an active allotrope of lead dioxide and containing less than 0.4 coulombs/in^2 of oxidizable material.

3,887,399
METHOD FOR PRODUCING ELECTRICAL ENERGY WITH CONSUMABLE ALUMINUM ANODE

Harvey N. Seiger, Granada Hills, Calif., assignor to Textron Inc., Providence, R.I.

Filed May 10, 1971, Ser. No. 141,880
Int. Cl. H01m *29/04*
U.S. Cl. 136—86 A **9 Claims**

1. A method for obtaining electrical energy, comprising the steps of:

providing a battery assembly comprising an aqueous substantially neutral electrolyte, a consumable anode in said electrolyte, said anode comprising about 98 weight percent or more aluminum, and a permeable, electrically conductive cathode in said electrolyte; and

introducing elemental halogen fluid internally of said cathode for diffusion therethrough into contact with said electrolyte;

said electrolyte comprising a strongly ionized salt, and including at least 10^{-5} mole/liter of mercury ion, as activating ions for said aluminum, said salt being so selected that the open circuit voltage of said assembly is about 2.5 volts or higher.

3,887,400
METHOD AND APPARATUS FOR ELECTROCHEMICALLY PRODUCING AN ELECTRIC CURRENT

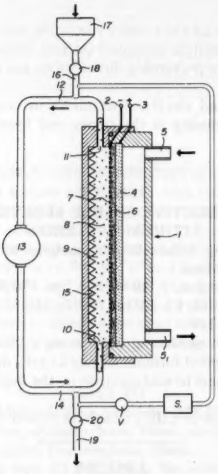
Denis Doniat, Moillesulaz/Ge.; Klaus Beccu, Troinex/Ge., and Augusto Porta, Geneva, all of Switzerland, assignors to Battelle Memorial Institute S.A. Automobiles Citroen

Continuation of Ser. No. 151,094, June 8, 1971, abandoned. This application May 14, 1973, Ser. No. 360,175

Claims priority, application Switzerland, June 9, 1970, 3619/70

Int. Cl. H01m *29/04*

U.S. Cl. 136—86 A **7 Claims**



1. A method of producing electric power by electrochemical oxidation of zinc powder in an alkaline galvanic cell having a solid positive electrode in the form of an oxygen or metal oxide electrode operatively associated with a negative current collector for contact with the zinc powder undergoing oxidation during discharge, said method comprising the steps of:

producing electric current by effecting circulation of a suspension, formed of zinc powder in an alkaline electrolyte, along a closed-loop path which is composed, on the one hand, of a first part wherein are effected the steps of providing flow of the entire suspension under agitated flow conditions along the surface of the negative current collector and of causing repeated impingement of the suspended zinc particles on said surface to thereby undergo repeated momentary oxidations and, on the other hand, of a second part wherein the suspension containing the said zinc particles carrying thereon the products of said momentary oxidations is removed from the collector and made to circulate without contacting the said collector so as to continually provide transfer of said products of said momentary oxidations from the suspended zinc particles to the bulk of the electrolyte of the suspension circulating along said second part before renewed flow thereof along the said collector, whereby said circulation along the closed-loop path provides continuous discharge, by a rapid succession of said momentary oxidations, with continual recycling of said suspension to said collector from said second part, said suspension which is being recycled to said collector containing said zinc particles from which said oxidation products have been removed and which are composed of zinc in a sufficient amount to insure substantially constant current delivery by the cell, whereby said zinc particles are gradually consumed in a succession of rapid passages thereof through the cell during discharge.

3,887,401
MAGNETIC PARTS AND METHOD OF MANUFACTURING SAME

Max Hetzel, Biel, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Switzerland

Filed Apr. 16, 1973, Ser. No. 351,324

Claims priority, application Switzerland, May 5, 1972, 6741/72

Int. Cl. H01f *1/00*

U.S. Cl. 148—121 **6 Claims**

1. A method of manufacturing small maagnetizable parts to eliminate rest magnetism therefrom, said parts being of the size range suitable for incorporation into wrist watches and like mechanical appliances, said method comprising the steps of:

heating the parts by combustion process during a first interval of time to a temperature substantially above the Curie point of the parts while maintaining said parts in a shielded heating environment free of any magnetic fields greater than about 5 Oersted;

rapidly cooling said parts to an annealing temperature above the Curie point while maintaining said shielded environment;

maintaining said parts at said annealing temperature over a second interval of time; and,

slowly cooling said parts to room temperature.

3,887,402
METHOD FOR PRODUCING HIGH DENSITY STEEL POWDERS

Yoshikazu Kondo, Yokohama, and Mitsuo Ohhori, Kudamatsu, both of Japan, assignors to Kozo Yoshizaki, Tokyo, Japan

Filed Dec. 26, 1973, Ser. No. 428,013

Claims priority, application Japan, Dec. 25, 1972, 47-129379

Int. Cl. B22f *9/00*

U.S. Cl. 148—126 **14 Claims**

1. A method for producing high density steel powders, suitable for powder metallurgy; characterized in that atomized steel powders and atomized alloy steel powders, having 0.02 to 0.38 percent by weight of carbon and 0.20 to 0.50 percent by weight of oxygen contained, and wherein the quantitative relation of carbon to oxygen can meet the equation $C\% = K \cdot O\%$ (K=0.375 to 0.75), are heated at 600° to 1,250°C in inert gas, whereby reduction as well as decarburization and softening are simultaneously carried out.

3,887,403
PROCESS AND SOLUTION FOR REMOVING TITANIUM AND REFRACTORY METALS AND THEIR ALLOYS FROM TOOLS

Dolphus L. Coggins, Berkeley, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 269,133, July 5, 1972, abandoned. This application Oct. 15, 1973, Ser. No. 406,237

Int. Cl. C23f *1/02;* **C09k** *3/00*

U.S. Cl. 156—7 **7 Claims**

1. A composition for removing refractory metals, titanium and alloys of refractory metals and alloys of titanium from a metallic based tool without attacking the metal base, said composition being acidic and comprising: about 0.7% to about 17.5% by weight of a source of fluoride ions calculated as hydrofluoric acid; from about 0.9% to about 22.5% by weight of COOH radical provided by a COOH supplying material selected from the group consisting of mono and dicarboxylic acids of 1 to 6 carbon atoms; about 49% to about 24.97% by

weight of a hydroxylated carboxylic acid selected from the group of hydroxylated mono, di or tricarboxylic acids of 1 to 6 carbon atoms and containing from 1 to 5 hydroxyl groups, and the remainder being water.

3,887,404

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES

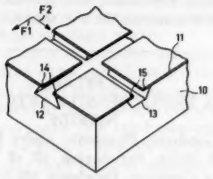
Jean-Paul Chané, Yerres, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 23, 1973, Ser. No. 326,038

Claims priority, application France, Jan. 27, 1972, 72.02669

Int. Cl. H01 *5/00, 7/64*

U.S. Cl. 156—8 **21 Claims**



1. A method of producing a semiconductor device comprising at least one recess, comprising the steps of:

a. providing a body comprising a surface portion that defines a substantially flat surface, said surface portion consisting essentially of an $A^{III} B^{V}$ material;

b. providing a mask at said surface to cover a first portion thereof;

c. selectively etching only a part of said surface that is uncovered by said mask by subjecting said part to an oxidizing etchant passed through an opening in said mask; and

d. selectively etching said part by separately subjecting said part of said surface portion to a gaseous acid etchant passed through an opening in said mask.

3,887,405

METHOD AND COMPOSITION FOR CLEANING COPPER SURFACES

Jaan-Jiue Fong, Tolland, and Merton M. Beckwith, Rockville, both of Conn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 10, 1974, Ser. No. 468,645

Int. Cl. C23f *1/00*

U.S. Cl. 156—18 **12 Claims**

1. A mild etchant for copper workpieces consisting essentially of an aqueous solution of 60–240 grams per liter of an alkali metal monopersulfate, 15–500 parts per million of a water-soluble inorganic chloride compound, sulfuric acid in an amount sufficient to provide a pH of 0.2–1.8, and up to 10 grams per liter of an alkali metal sulfate.

3,887,406

PRODUCTION OF BUILDING BOARD

Thomas Gwynne, Loughborough, England, assignor to BPB Industries Limited, London, England

Filed Oct. 24, 1972, Ser. No. 300,351

Claims priority, application United Kingdom, Oct. 22, 1971, 49277/71; May 15, 1972, 22650/72

Int. Cl. B32b *3/18, 31/12*

U.S. Cl. 156—42 **7 Claims**

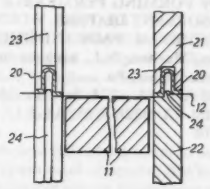
1. A method for the production of lined cementitious board comprising the steps of:

continuously advancing a first sheet in a generally horizontal plane;

providing a reinforcing strip of rigid material formed with a section of desired non-planar profile;

supplying such reinforcing strip to the upper surface of at least one lateral edge of said first sheet and securing said strip to said edge with such profile in a first orientation relative to said plane;

depositing an aqueous slurry of cementitious material on the upper surface of said first sheet;



folding the lateral edges of said first sheet upwards as the sheet advances and rotating said strip therewith from said first orientation into the orientation and disposition said strip will have in the finished board, without alteration of the profile of said strip;

laying a second sheet over said slurry and the upwardly folded lateral edges of said first sheet;

forming said slurry to the desired thickness;

and securing said two sheets together at their lateral edges whereby said strip is incorporated in the formed board.

3,887,407

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE WITH NITRIDE OXIDE DOUBLE LAYER FILM

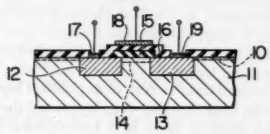
Minoru Ono, Kodaira, and Toshimitu Momoi, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan

Division of Ser. No. 65,383, Aug. 20, 1970, Pat. No. 3,788,913, which is a division of Ser. No. 701,988, Jan. 31, 1968, abandoned. This application Oct. 17, 1973, Ser. No. 407,223

Claims priority, application Japan, Feb. 3, 1967, 42-6608; Feb. 3, 1967, 42-6609

Int. Cl. H01 *7/50*

U.S. Cl. 156—11 **2 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of:

a. forming a semiconductor substrate with a PN junction the entire termination of which is covered with a first insulating film consisting essentially of silicon dioxide;

b. forming a hole in the first insulating film so as to expose a surface portion of said semiconductor substrate, while maintaining the entire termination of said PN junction covered with said first insulating film;

c. covering the entire exposed upper surface of said first insulating film, the entire side walls in said hole of said first insulating film, and the exposed surface portion of said semiconductor substrate with a second insulating film consisting essentially of silicon nitride, so that said second insulating film is spaced from the termination of said PN junction;

d. completely covering said first and second films, except for a portion of said second film directly contacting the surface of said semiconductor substrate at a location in said hole spaced from the portion of the surface covered

with said first insulating film, with a corrosion resistive mask; and

e. exposing the combination thus composed to an etchant to partially etch away the portion of said second insulating film not covered with said corrosion resistive mask, so as not to expose said first insulating film to said etchant.

3,887,408

METHOD OF FORMING PERMEABLE POLYMERIC LINER ON ABSORBENT DIAPERS, WOUND DRESSINGS, CATAMENIAL PADS AND THE LIKE

Charles E. Hoey, Marlton, N.J., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Apr. 24, 1973, Ser. No. 354,062
Int. Cl. B32b *5/18;* **A61f** *13/18*
U.S. Cl. 156—78 **5 Claims**

1. In a process of making a flexible absorbent pad comprising a top layer of soft polymeric foam material prepared from an ethylenically unsaturated acrylic monomer which is permeable to liquids, an underlying layer of liquid-absorbent material, and a bottom film of flexible moisture-impervious material, the improvement comprising foaming said polymer in the form of an aqueous latex, applying it to the absorbent layer, the foam having a wet density of about 0.1 to about 0.5 grams per cm^3 and a wet thickness of about 4 mils to about 45 mils, drying the foam without substantially reducing its thickness and crushing the foam to a thickness of between about 5 percent and about 35 percent of the thickness of the original wet foam material, whereby a textile-like laminate is obtained, the foam in dry form being collapsed.

3,887,409

VINYL STRUCTURE HAVING AN EMBOSSED TOP LAYER AND A FOAM BASE

Willard E. McCreary, Lancaster, and Elvin M. Weidman, Willow Street, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Dec. 7, 1972, Ser. No. 312,813
Int. Cl. B32b *31/26*
U.S. Cl. 156—79 **1 Claim**

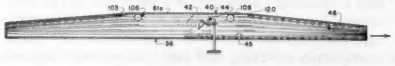
1. The technique for forming an embossed two-layer plastisol sheet material comprising the steps of depositing a first foamable plastisol material on a carrier structure, depositing a second embossable plastisol material of substantially the same composition as the first plastisol layer over top of the first plastisol layer, said second plastisol layer having a lower temperature fusing point than said first plastisol layer, heating both layers to a temperature above the fusing temperature of the first plastisol layer to fuse both plastisol layers and to foam the foamable layer, cooling both layers and then reheating just the second plastisol layer to a temperature of about 300°F which is approximately the fusing temperature of said second plastisol layer and which is about 100°F below the fusing temperature of said first plastisol layer and embossing just the second plastisol layer.

3,887,410

METHOD FOR FABRICATING DOUBLE-SKIN FOAM CORE CONSTRUCTION PANELS

Robert G. Lindner, Sewickley, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed Sept. 5, 1973, Ser. No. 394,503
Int. Cl. B32g *5/18*
U.S. Cl. 156—79 **9 Claims**



1. A method of fabricating a foam filled construction panel which comprises a liner sheet, a facing sheet, and a foamed-in-place foam core, the two sheets having central webs, first edges and second edges, said method including:

aligning the two sheets with the central webs thereof in confronting relation;

joining the two sheets by means of a resilient strip connection along adjacent first edges thereof;

diverging the two sheets along second edges thereof remote from said resilient strip connection, thereby to provide an opening therebetween;

introducing foamable foam forming ingredients through said opening between the second edges of the two sheets and onto at least one of the sheets;

converging the two sheets along the second edges thereof to position the central webs thereof in confronting relation, while the foam forming ingredients therebetween are actively foaming and increasing in volume; and

retaining the two sheets in the confronting relation until the foam forming ingredients have completed their foaming and volume expansion, and provide a foamed-in-place core which connects the two sheets.

3,887,411

MAKING A TRIPLE DENSITY ARTICLE OF SILICON NITRIDE

Michael U. Goodyear, Plymouth; Andre Ezis, Gross Ile, and Karsten H. Styhr, Farmington, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 20, 1973, Ser. No. 426,832
Int. Cl. C04b *39/12*
U.S. Cl. 156—89 **7 Claims**

1. A method of making a triple density article of silicon nitride which comprises the steps of:

compacting a mixture consisting of from about 95 to 99.5% by weight silicon nitride particles and from about 5 to 0.5% by weight of a densification aid to at least 98% of theoretical density by use of heat and pressure thereby to form a first element of silicon nitride;

forming the general shape of a second element by (a) injection molding silicon metal particles and a carrier to form the general shape of said second element, and (b) heating said second element to burn out said carrier;

forming the general shape of a third element by a slip casting operation, said slip casting being accomplished from a slip containing silicon metal particles suspended in a vehicle;

sintering said third element in an inert atmosphere for a time and at a temperature sufficient to increase the strength of said third element, the inert atmosphere being formed of a gas which will not react with the silicon metal particles;

positioning said third element adjacent at least a portion of the surface area of said second element in a manner such that a small space exists between at least a portion of said two elements;

bonding said second element to said third element by a slip casting operation in which a slip containing silicon metal particles suspended in a vehicle is applied to said space existing between said two elements to build up silicon metal particles in said space;

nitriding said bonded second and said third elements in a single operation so that both of said elements are converted substantially to pure silicon nitride and are joined to one another at the area of the slip cast bonding operation;

bringing a surface area of said first element into close association with a surface area of said third element;

holding said associated surfaces of said first and said third elements so they do not move with respect to one another; and

forming a bond between said associated surfaces of said first and said third elements by applying heat to both elements and pressure on one of said elements while the other of said elements is held thereby to force a portion of the

silicon nitride forming said surface area of said one element into bonding relationship with said surface area of the other element.

3,887,412
METHOD OF MAKING A TRIPLE DENSITY SILICON NITRIDE ARTICLE

Karsten H. Styhr, Farmington; Andre Ezis, Grosse Ile, and Michael U. Goodyear, Plymouth, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 20, 1973, Ser. No. 426,835
Int. Cl. C03b *29/00*
U.S. Cl. 156—89 **6 Claims**

1. A method of making a triple density article of silicon nitride which comprises the steps of:

compacting a mixture consisting of from about 95 to 99.5% by weight silicon nitride particles and from about 5 to 0.5% by weight of a densification aid to at least 98% of theoretical density by use of heat and pressure thereby to form a first element of silicon nitride;

forming the general shape of a second element by (a) injection molding silicon metal particles and a carrier to form the general shape of said second element, and (b) heating said second element to burn out said carrier;

forming the general shape of a third element in physical association with the general shape of said second element by slip casting said third element adjacent to at least a portion of said second element, said slip casting being accomplished from a slip containing silicon metal particles suspended in a vehicle;

nitriding said second and said third elements in a single operation so that both of said elements are converted substantially to pure silicon nitride and are joined to one another at the area of slip casting contact;

bringing a surface area of said first element into close association with a surface area of said third element;

holding said associated surfaces of said first and said third elements so they do not move with respect to one another; and

forming a bond between said associated surfaces of said first and said third elements by applying heat on all the elements and pressure on at least one of said elements while the other of said elements is held thereby to force a portion of the silicon nitride forming said surface area of said one element into bonding relationship with said surface area of the other element.

3,887,413
METHOD FOR REPAIRING PLASTIC MATERIALS

Lawrence Speer, Barbertown, N.J., assignor to Vinyltron Corporation, Amsterdam, N.Y.

Filed Aug. 7, 1973, Ser. No. 386,345
Int. Cl. B32b *35/00*
U.S. Cl. 156—94 **7 Claims**

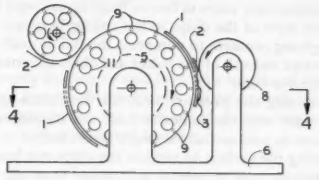
INSERT BACKING MATERIAL
COAT UNDAMAGED MATERIAL ABOUT DAMAGED AREA WITH PROTECTIVE PASTE
FILL DAMAGE WITH FILM FORMING PASTE
COVER DAMAGE WITH GRAINING PAPER
APPLY A FLAT HOT SURFACE AGAINST DAMAGE
REMOVE HOT SURFACE AND GRAINING PAPER
REMOVE PROTECTIVE COATING

6. A process for repairing a damage in plastic or leather-like fabrics comprising the steps of placing a backing member in contact with the material to be repaired for defining a void with the edges of said damage, coating the undamaged material surrounding said damage with a heat insulating paste, filling said void with a mixture of a film forming material and a plasticizer, covering said void with a vinyl release paper, applying a flat hot surface to the vinyl release paper for a time and at a temperature to cure said mixture and removing said flat surface, said paper and said coating, wherein said heat insulating paste comprises a mixture of Bentonite and talc in water.

3,887,414
ENVELOPE WINDOW PATCHING

Robert Cohn, Millbrae, Calif., assignor to Champion International Corporation, Hamilton, Ohio

Filed Mar. 26, 1973, Ser. No. 345,165
Int. Cl. B31b *1/82*
U.S. Cl. 156—108 **7 Claims**



1. A process of applying a window patch to a container blank such as an envelope or web for formation into a window container and having a window cut out comprising the steps of

A. Feeding a strip of hot melt coated transparent or translucent window patch material;

B. Severing a patch from said strip by cutting off a predetermined length of it;

C. Feeding said blank or web material to a rotating cooled vacuum drum with a cylindrical outer surface and securing it uniformly over its entire surface area by vacuum to said cylindrical surface of said drum;

D. Depositing said patch over the window cut out area in said blank or web and holding it in place uniformly over its entire surface area within the marginal confines of said window cut out by vacuum thereby pulling the patch down in its free area into the window opening; while leaving the marginal edges of the patch overlying the marginal edge areas circumscribing the window cut out area; and

E. Moving said blank or web with the patch on it on said drum convex surface through a nip formed by rotating said drum against a rotating heated roll so that the heated roll contacts only the overlapped marginal edges of said patch and said blank or web circumscribing said window cut out whereby the hot melt adhesive is softened sufficiently to adhere said patch to said blank only in said overlapped areas.

3,887,415
PANEL WITH DECORATIVE BARK SURFACE AND METHOD OF MAKING THE SAME

Armin Elmendorf, Portola, and Roland Etzold, Mountain View, both of Calif., assignors to Elmendorf Research, Inc., Palo Alto, Calif.

Filed May 16, 1973, Ser. No. 360,704
Int. Cl. B32b *31/32, 31/14, 5/16;* **B27l** *11/00*
U.S. Cl. 156—154 **8 Claims**

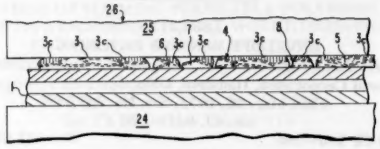
1. A method of producing a panel having decorative bark facing which comprises the following steps:

placing bark flakes and chips on an adhesive-coated lignocellulosic substrate in a single layer; and

applying pressure and compressing the flakes until pressure is exerted onto most of both the flakes and the chips and until both are bonded to the substrate in a single layer.

8. A method of producing a hard, decorative bark facing on a ligno-cellulosic substrate which includes in part the following steps:

placing bark flakes in a single layer on an adhesive-coated substrate with open spaces between the flakes;



depositing bark chips in two or more layers onto the surface with most of the chips in the spaces between the flakes;

applying pressure to compress the flakes until pressure is exerted onto all of the flakes and chips in contact with the adhesive coat;

maintaining the pressure until all the flakes and chips in contact with the adhesive coat are bonded to the substrate in substantially a single layer; and

abrading the surface to remove the chips not bonded to the substrate and to remove soft tissue from the flakes and chips bonded to the substrate.

3,887,416

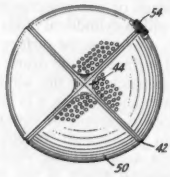
METHOD OF MANUFACTURING A LEATHER COVERED FOOTBALL

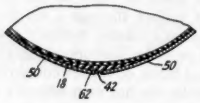
Herbert E. Tebbetts, Jr., Huntington Beach, Calif., assignor to AMF Incorporated, White Plains, N.Y.

Filed Jan. 22, 1973, Ser. No. 325,572

Int. Cl. B65c *3/26;* **A63b** *5/00*

U.S. Cl. 156—156 **1 Claim**





1. In the method of making a leather panel covered football comprising essentially an inner ellipsoid shaped rubber bladder, four exterior leather panels, and an intermediate bladder reinforcing layer, all bonded together, the improvement of inherently building into said football the shape, bounce, feel and flight characteristics of a hand sewn leather football, said method comprising winding a reinforcing cord on said bladder, covering said cord with a layer of rubber, and then bonding four leather panels to said rubber layer, said improvement comprising the additional method step of prior to covering said rubber layer with said leather panels covering said rubber layer with four longitudinally extending and circumferentially equidistantly spaced rubber side panels having integral central raised seams and tapered side portions, and with two end panels having two right angle crossed integral raised seams and tapered side portions, so that the ends of the crossed raised seams are aligned with the ends of the side panel raised seams, whereby said leather panel covered football has weighted ends, and an out of round shape similar to a hand sewn leather football in that its diameter is gradually enlarged at said seams.

3,887,417

NON-WOVEN FABRICS

Barrie Linton Davies, Pontypoal, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 817,796, April 21, 1969. This application Nov. 3, 1971, Ser. No. 195,203

Int. Cl. D04h *3/08*

U.S. Cl. 156—181 **8 Claims**

1. In a process for making a non-woven fibrous web of continuous filaments bonded at their cross-over points, said process being of the kind including the steps of forming a web of continuous filaments of a type which are capable of elongating at least 3% and effecting elongation and bonding of the filaments at their cross-over points while restraining the web from change in length or width, the improvements comprising effecting and completing the elongation of said filaments under said restraint before said bonding step, and subsequently effecting said bonding step without effecting any increase in filament length so as to produce a filament configuration within the web wherein at least 10% of the filaments lie at an angle of between 45° and 90° to the plane of the web at the mid-plane of the web, thereby producing a web having improved handle and wear properties.

3,887,418

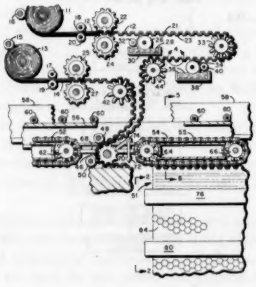
HONEYCOMB PRODUCT AND PROCESS FOR MANUFACTURE

Peter J. Jurisich, 4731 Royce Rd., Irvine, Calif. 92664

Filed May 14, 1973, Ser. No. 360,106

Int. Cl. B31d *3/02*

U.S. Cl. 156—197 **8 Claims**



1. A process for the manufacture of honeycomb comprising:

corrugating a web material to form alternating crest and trough areas;

applying adhesive coatings to the corrugated webs and forming a stack of said adhesive coated webs so that said crest and trough areas are in substantial nesting alignment;

applying said adhesive coatings only to the extreme outer surfaces of the crests and to the extreme outer surface of the troughs of alternate layers of the corrugated web materials; said stack being formed by alternating layers of adhesive coated and uncoated corrugated webs;

allowing the adhesive coatings to cure and bond the stacked webs together; and,

expanding said bonded webs to form an open celled honeycomb structure.

7. A process for the manufacture of honeycomb comprising: corrugating a web material to form alternating crest and trough areas; applying adhesive coatings to the corrugated webs and forming a stack of said adhesive coated webs so that said crest and trough areas are in substantial nesting alignment;

said adhesive coatings are applied only to the extreme inner surface of the crests and to the extreme inner surface of the troughs of alternate layers of corrugated web material;

said stack is formed by alternating layers of adhesive coated and uncoated webs; and,

further comprising applying pressure to the stacked webs while allowing the adhesive coating to cure, expanding said bonded webs to form an open celled honeycomb structure.

8. A process for the manufacture of honeycomb comprising: corrugating a web material to form alternating crest and trough areas, applying adhesive coatings to the corrugated webs and forming a stack of said adhesive coated webs so that said crest and trough areas are in substantial nesting alignment;

said adhesive is applied only to the extreme outer surface of the crests of one layer of corrugated web and said adhesive is applied only to the extreme inner surfaces of the troughs of another layer of corrugated web; and,

wherein the layers of web are stacked together by alternating an outer crest coated web with an inner trough coated web, so that the adhesive coatings all face in the same direction; and,

applying pressure to the stacked webs while allowing the adhesive coatings to cure, expanding said bonded webs to form an open celled honeycomb structure.

3,887,419
APPARATUS AND METHOD FOR CONTINUOUSLY FORMING HONEYCOMB MATERIAL

Robert C. Geschwender, Lincoln, Nebr., assignor to Lancaster Research and Development Corporation, Lincoln, Nebr.

Filed July 16, 1973, Ser. No. 379,451
Int. Cl. B31d *3/02*
U.S. Cl. 156—197 **38 Claims**

1. Apparatus for continuously forming honeycomb material of a predetermined width dimension comprising:

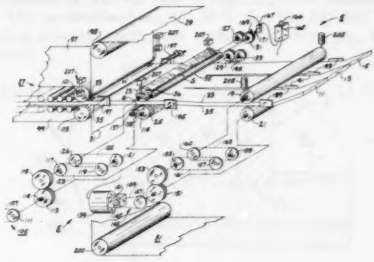
means for continuously feeding open cell honeycomb material with its cells expanded to a preselected degree so that the honeycomb material has said predetermined width;

a source of less completely expanded honeycomb material; and

means intermittently operable in response to the feeding of a preselected length of open cell honeycomb material by the feeding means for supplying to the feeding means from the source a length of less completely expanded honeycomb material which when expanded to the preselected degree will have a length equal to said preselected length thereby to insure that the feeding means continuously forms honeycomb material having the preselected degree of expansion and the predetermined width.

24. A method of forming honeycomb material of a predetermined width dimension comprising the steps of:

continuously feeding from feed rolls open cell honeycomb material having its cells expanded to a preselected degree so that the honeycomb material has said predetermined width dimension; and



intermittently feeding to said feed rolls lengths of less completely expanded honeycomb material each of which when expanded to the preselected degree has a length equal to said preselected length.

3,887,420
OFFSET TRANSFER OF DECALCOMANIAS

Saul W. Weingrad, Hillsdale, N.J., assignor to Pictorial Productions, Inc., Mount Vernon, N.Y.

Continuation of Ser. No. 139,044, April 30, 1971, abandoned. This application Mar. 29, 1973, Ser. No. 345,970
Int. Cl. B44c *1/16;* **B32b** *1/00;* **C09j** *5/06*
U.S. Cl. 156—235 **5 Claims**

1. A process for the transfer of a printed design comprising a first film layer, a design layer and a second film layer from a substrate therefor to a ware by means of a compressible transfer surface provided on a transfer head, said first film layer having a greater coefficient of adhesion to said transfer surface than said second film layer to said substrate but a lesser coefficient of adhesion to said transfer surface than said second film layer to said ware; said process comprising the steps of:

compressing said transfer surface against said printed design;

transferring said printed design from said substrate to said transfer surface;

compressing said transfer surface with said design thereon against said ware; and

transferring said printed design from said transfer surface to said ware.

3,887,421
METHOD OF MASKING SEMICONDUCTOR WAFERS USING A SELF-ALIGNING MASK

James L. Hudson, and Larry L. Jordan, both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 325,227, Jan. 22, 1973, Pat. No. 3,841,261. This application June 5, 1974, Ser. No. 476,411
Int. Cl. B44d *1/20;* **B05c** *11/00*
U.S. Cl. 156—280 **1 Claim**

1. A process for applying a wax maskant to selected portions of a semiconductor wafer face prior to chemical etching of said wafer face, said process comprising:

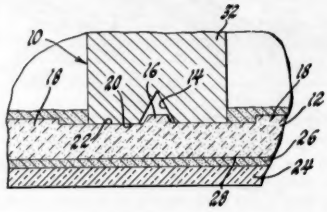
forming a pattern of ridges on a face of a wafer of semiconductive material having a plurality of regions containing active semiconductor devices;

affixing an opposite face of said wafer to a support;

placing a face of a spray mask on said wafer, said spray mask being a grid of a magnetic metal, said grid having a plurality of intersecting portions surrounding apertures corresponding to said regions in said wafer, and having a

pattern of grooves on said face corresponding to said pattern of ridges on said wafer face;

nesting said ridges in said grooves and abutting said spray mask face with said wafer face to interlock said mask with said wafer and align said grid apertures with said wafer regions;



magnetically holding said mask against said wafer face;

spraying wax onto said wafer regions through said apertures in said mask; and

removing said mask from said wafer face.

3,887,422

ADHESIVE COMPOSITION AND METHODS

David S. Bosniack, Baytown, Tex., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 245,389, April 19, 1972, abandoned. This application Aug. 15, 1973, Ser. No. 388,707

Int. Cl. C09j *3/14*

U.S. Cl. 156—334 **10 Claims**

1. A method for bonding two substances together which comprises in combination the steps of:

a. wetting at least a portion of the surface of each of said substances with an adhesive composition comprising (i) from about 20 to about 80 weight percent of a reject polypropylene containing, on a dry basis, from about 5 to about 95 weight percent of atactic polypropylene, from about 95 to about 5 weight percent isotactic polypropylene, and from about 1 to about 20 weight percent inorganic salts and (ii) from about 80 to about 20 weight percent asphalt; and

b. contacting said wetted surfaces with one another under sufficient pressure to create a strong bond between said substances.

3,887,423

TIRE BUILDING MACHINE

Georges Gazuit, Montlucon, France, assignor to NRM Corporation, Akron, Ohio

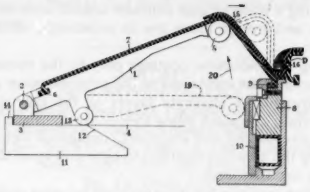
Filed Nov. 17, 1969, Ser. No. 877,399

Claims priority, application France, Nov. 27, 1968, 68.175507

Int. Cl. B29h *17/22*

U.S. Cl. 156—402 **16 Claims**

1. In a tire building machine, a rotatable drum adapted to receive ply stock thereon, the edges of such stock extending beyond such drum and adjacent a tire bead at the end of such drum, a plurality of pivotally mounted fingers at each end of said drum, the distal ends of said fingers being axially coextensive with such stock edges, means to pivot said fingers to cause the distal ends thereof to turn such stock edges, means then axially to move said fingers to cause such stock edges to wrap around such bead, a radially movable bead clamp operative to clamp said ply against such bead, and an elastic annular bladder extending from such bead clamp about said fingers.



3,887,424

MACHINE FOR PRODUCING NON-WOVEN FLOOR COVERINGS

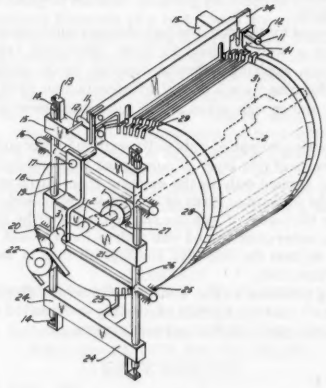
Stoyan Iliev Julev; Mihail Yordanov Milkov; Lyubomir Petrov Dachev; Rossen Petrov Vassilev, and Simeon Alexandrov Grigorov, all of Sofia, Bulgaria, assignors to ZNIRD pri DSO "TEXTIL", Sofia, Bulgaria

Filed Apr. 16, 1974, Ser. No. 461,414

Claims priority, application Bulgaria, Apr. 16, 1973, 23328

Int. Cl. D04h *11/08;* **B31f** *1/20*

U.S. Cl. 156—435 **17 Claims**



1. A machine for producing non-woven floor coverings, said machine comprising a horizontal drum having a plurality of longitudinally extending equally spaced grooves therein extending completely about its periphery, a drum supporting shaft mounted therewithin coaxial thereof, two parallel frames, one disposed at each end of the drum in a respective plane transverse to the axis of the drum, each frame having two spaced vertical guide members, the frame being mounted for movement in a transverse horizontal direction, means for rotatably driving the shaft, means for reciprocating the frame in a horizontal direction comprising an intermediate traverse slidable along the vertical guide members of the frame and first, smaller eccentrics mounted on the drum supporting shaft adjacent the respective ends of the drum, means on the intermediate traverse constituting first eccentric follower means, upper and lower traverses mounted above and below, respectively, the intermediate traverse, means connecting the upper and lower traverses to move in unison, said last named means comprising a second eccentric having an eccentricity markedly greater than that of the first eccentric, integrally attached to said drum supporting shaft, and second eccentric follower means connected to the connected upper and lower traverses, discs on the ends of the drum having grooves therein aligned

with respect to the grooves in the drum proper, drum indexing fingers connected to the respective upper and lower traverses for alternate engagement with the grooves in the grooved discs affixed to the drum, a beating blade extending longitudinally of the drum, and means connecting the ends of the beating blades to the upper traverses at the opposite ends of the drum, the drum indexing fingers and the beating blade describing a substantially elliptical path having a vertical axis which markedly exceeds in length the length of the horizontal axis.

3,887,425

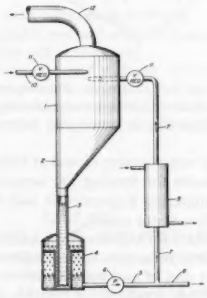
CONCENTRATING ACRYLAMIDE SOLUTIONS

Robert James Munch, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Oct. 1, 1973, Ser. No. 402,654

Int. Cl. C07c *103/00;* **B01d** *1/00, 1/16*

U.S. Cl. 159—48 L **4 Claims**



1. A process of concentrating aqueous acrylamide solution by flash evaporation of water therefrom while inhibiting polymerization of acrylamide, comprising the steps of

a. flash-evaporating water from aqueous acrylamide feed solution having more than 50 percent by weight water in the total feed, by constantly introducing said feed solution into an evaporation chamber in which pressure has been reduced to a selected pressure in the range from about 60 to about 450 mm Hg and with at least a portion of said feed entering said chamber at temperature higher than the boiling point of said feed at the defined reduced pressure in said chamber, and

b. constantly removing from said chamber to atmospheric pressure the liquid residue from said flash-evaporation at a rate sufficient to avoid accumulation of acrylamide solution in said chamber, and

c. during said flash-evaporation in said chamber constantly washing the surfaces that contact acrylamide in said evaporation chamber, and

d. as soon as said liquid residue from evaporation is removed to atmospheric pressure, restoring absorbed oxygen to saturation in said residue and,

e. recycling part of said residue with oxygen restored to saturation therein to said evaporation chamber with the temperature of said recycled liquid below its atmospheric boiling point but above the existing boiling point of said liquid inside said chamber at the reduced pressure therein.

3,887,426

PROCESS FOR PRODUCING CELLULOSE PULP BY DIGESTION WITH A DIOL OR TRIOL SOLVENT AND AN ANILINE OR PHENOL SALT

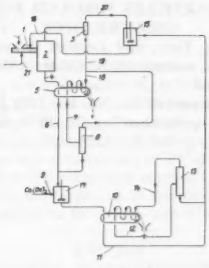
Andre Fogarassy, Paris, France, assignor to Societe Generale de Brevets Industriels et Chimiques, Switzerland

Continuation of Ser. No. 74,671, Sept. 23, 1970, abandoned. This application Mar. 15, 1973, Ser. No. 341,508

Claims priority, application Switzerland, Sept. 26, 1969, 14522/69

Int. Cl. D21c *3/20*

U.S. Cl. 162—29 **21 Claims**



1. A process for producing cellulose pulp comprising

contacting wood chips containing lignin with a solution of a solvent selected from the group consisting of at least one saturated aliphatic diol or triol and a sufficient amount of a compound selected from the group consisting of an alkali metal salt of aniline, an alkaline earth metal salt of aniline and sodium phenate to dissolve the lignin in said wood chips;

digesting the solution contacted wood chips at a temperature higher than 100°C for about 30 minutes to 3 hours whereby said lignin is dissolved in the form of a soluble derivative;

separating the resultant cellulose pulp from said solution;

converting said lignin soluble derivative to an insoluble product;

separating said insoluble product from the solvent solution; and

recovering said solvent which is suitable for reuse.

3,887,427

PROCESS FOR SIZING CELLULOSE FIBERS

Karin Ulla Elisabet Helmer, Solna, and Alf Ragnar Reuterhall, Gustavsberg, both of Sweden, assignors to Kemanord AB, Stockholm, Sweden

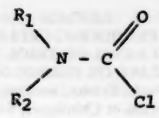
Filed July 14, 1972, Ser. No. 271,858

Claims priority, application Sweden, Nov. 16, 1971, 12622/71

Int. Cl. D21d *3/00*

U.S. Cl. 162—158 **14 Claims**

1. A process for sizing cellulose fibers or material containing cellulosic fibers wherein the cellulose fibers are brought into contact with at least 0.001% by weight based upon the weight of the dry cellulose fibers of a carbamoyl chloride having a general formula



wherein R_1 is an organic, hydrophobic hydrocarbon group containing 8–40 carbon atoms and R_2 is selected from the group consisting of hydrogen, lower alkyl and organic, hydrophobic hydrocarbon group containing 8–40 carbon atoms.

3,887,428

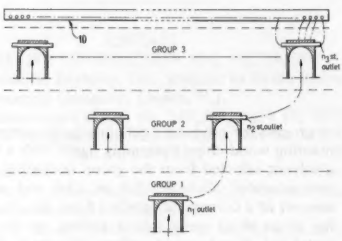
MANUFACTURE OF CONTINUOUS MATERIAL WEBS OF FIBROUS PARTICLES AT HIGH CONSISTENCIES BY PASSING PARTICLES THROUGH A SERIES OF CONSTRICTIONS

Douglas Wahren, Taby, and Lennart Reiner, Gustavsberg, both of Sweden, assignors to A. Ahlstrom Osakeyhtio, Noormarkku, Finland

Continuation-in-part of Ser. No. 157,120, June 28, 1971, abandoned. This application Dec. 20, 1973, Ser. No. 427,024

Int. Cl. D21f *1/06*

U.S. Cl. 162—216 **13 Claims**



1. An improved method of manufacturing a continuous material web of elongated fibrous particles including preparing a suspension of the particles in a liquid with the concentration of the fibrous particles in suspension being about 1.5 percent to 6.0 percent of the total weight of the liquid plus the fibrous particles; then forcing the suspension through a series of constrictions and deflecting the flow of the suspension after each constriction to create a turbulent flow ensuring uniform distribution over the web; and finally decaying the turbulent flow before deposition of the material and comprising the steps of:

gradually decreasing the scale and increasing the intensity of the turbulent flow in the series of constrictions by distributing the flow from one constriction over a plurality of subsequent constrictions of smaller diameter and said one constriction, the smallest constrictions of said series having a diameter not exceeding three times a mean particle length of said fibrous particles; and

eliminating all disrupting forces after the flow has passed through the smallest constrictions to transform the turbulent flow into a flow of a consolidated three-dimensional network structure of fibrous particles with entrained liquid before deposition thereof.

3,887,429

DEVICE FOR UNTANGLING AND DISPERSING FIBROUS MATERIALS

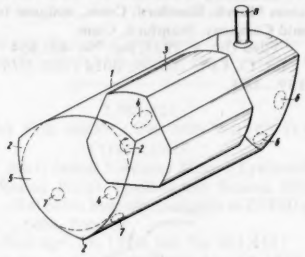
Eduard Schmid, Bonduz Gr; Reinold Nascher, Visp Vs; René Egli, Sins Ag, all of Switzerland; Noel James Parratt, Loughton, and Ronald William Gooding, Waltham Addey, both of England, assignors to Lonza, Ltd., Basle, Switzerland

Filed Mar. 7, 1973, Ser. No. 338,848

Claims priority, application Switzerland, Mar. 8, 1972, 3358/72

Int. Cl. D21j *3/00*

U.S. Cl. 162—261 **8 Claims**



1. Apparatus for treatment of a suspension of matted, tangled and interlocked fibrous materials suspended in a liquid to obtain a suspension in untangled form in said fluid which comprises:

a. a hollow stator casing closed at both ends and having

b. inlet means for feeding the suspension of said matted fibrous materials suspended in said fluid into one end of said hollow stator casing,

c. outlet means for withdrawing a suspension of said fibrous materials in untangled form suspended in the fluid from the other end of said hollow stator casing, and

d. a rotor body arranged for rotation about its longitudinal axis within said hollow stator casing, said hollow stator casing having an inner cross-section substantially in the form of a first regular polygon, said rotor body having an outer cross-section substantially in the form of a second regular polygon with rounded corners, the inscribed circle of said inner cross-section of said hollow stator casing and the circumscribed circle of said outer cross-section of said rotor body being concentric to each other, said longitudinal axis of said rotor body being arranged in the common center of said inscribed and said circumscribed circles, and the number of corner of said first polygon being equal to the number of corners of said second polygon.

3,887,430

CULTURE MEDIUM FOR TISSUE CULTURE TECHNIQUES

Harry L. Torney; Helen T. Torney, and Dale E. Bordt, all of Indianapolis, Ind., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 229,219, Feb. 24, 1972, abandoned, which is a continuation of Ser. No. 58,203, July 24, 1970, abandoned. This application July 9, 1973, Ser. No. 377,838

Int. Cl. C12k *9/00*

U.S. Cl. 195—1.7 **3 Claims**

1. In a tissue culture method comprising the steps of inoculating a protein-free, sterile tissue culture medium with living animal tissue cells and incubating said inoculated tissue culture medium under conditions conductive to cell propagation, the improvement which comprises the steps of mixing a growth-enhancing amount of a water-soluble lipid source selected from the group consisting of polysorbate 60 and polysorbate 80 with said medium, in an amount of from about 0.0010 to about 0.100 part by volume of lipid source per 100 parts by volume of medium, intimately contacting said me-

dium with a growth-enhancing amount of a strongly basic anion-exhance resin obtained by reacting trimethylamine with a halomethylated polymer prepared by reacting chloromethyl methyl ether in the presence of a zinc chloride catalyst with beads of a copolymer of about 98 percent of styrene and 2 percent of divinylbenzene and thereafter incubating said tissue culture medium, cells and polysorbate lipid source in intimate contact with said strongly basic anion-exchange resin under conditions conducive to cell propagation for a time sufficient to obtain substantial propagation of said cells.

3,887,431

YEAST PROTEIN ISOLATE WITH REDUCED NUCLEIC ACID CONTENT AND PROCESS OF MAKING SAME

Ernest Aleck Robbins, High Ridge; Robert William Sucher; Erich Henry Schuldt, Jr., both of St. Louis County; Daniel Robert Sidoti, Ballwin; Robert Dudley Seeley, Crestwood, and Jon Albert Newell, Webster Groves, all of Mo., assignors to Anheuser-Busch Incorporated, St. Louis, Mo.

Filed Nov. 29, 1972, Ser. No. 310,469

Int. Cl. A23j *1/18*

U.S. Cl. 195—5 **25 Claims**

6. A process for producing a yeast protein product comprising the steps of:

a. rupturing yeast cells containing nuclease,

b. separating the soluble nucleic acid, nuclease, and protein from the insoluble cell wall debris,

c. hydrolyzing the nucleic acid with the nuclease,

d. insolubilizing the protein, and

e. separating the insoluble protein fraction from the remaining solubles fraction containing the hydrolyzed nucleic acid.

3,887,432

6-AMINOPENICILLANIC ACID PREPARATION

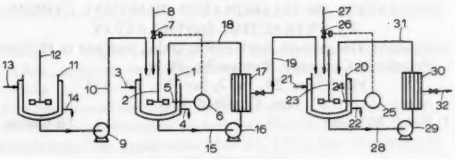
Michael Anthony Cawthorne, Horsham, England, assignor to Beecham Group Limited, England

Filed Nov. 14, 1973, Ser. No. 415,688

Claims priority, application United Kingdom, Nov. 21, 1972, 53822/72; Sept. 22, 1973, 44542/73

Int. Cl. C12d *1/02*

U.S. Cl. 195—36 P **5 Claims**



1. A process for the preparation of 6-aminopenicillanic acid which consists essentially in:

a. contacting, in aqueous solution at a pH within the range 6.0 to 9.0, benzylpenicillin or phenoxymethylpenicillin or a salt thereof with a water-soluble enzyme complex consisting of penicillin deacylase enzyme bonded to a sucrose-epichlorhydrin copolymer;

b. separating the said enzyme complex from the aqueous reaction mixture in an ultrafiltration unit;

c. recovering the formed 6-aminopenicillanic acid; and

d. re-using the separated aqueous solution of the said enzyme complex by contacting it with a further quantity of the penicillin.

3,887,433

PROCESS FOR PRODUCTION OF ANTIBIOTIC A-25822

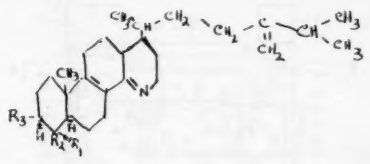
Robert H. Williams; Marvin M. Hoehn, and Karl-Heinz Michel, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 327,171, Feb. 2, 1973, Pat. No. 3,845,203. This application Mar. 21, 1974, Ser. No. 453,248

Int. Cl. C12d *7/00*

U.S. Cl. 195—81 **2 Claims**

1. The method for producing the antibiotic compound of



wherein R_1 and R_2 are both hydrogen or both methyl, and when R_1 and R_2 are both methyl R_3 is hydroxy; which comprises cultivating Geotrichum flavo-brunneum NRRL 3862 in a culture medium containing assimilable sources of carbon, nitrogen and inorganic salts under submerged aerobic fermentation conditions at a temperature of 25°–35°C and at a pH between 6 and 8 until a substantial amount of antibiotic activity is produced by said organism in said culture medium and recovering the antibiotic from said culture medium.

3,887,434

MICROBIOLOGICAL PRODUCTION OF INVERTASE

Werner Frommer, and Erich Rauenbusch, both of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 24, 1973, Ser. No. 363,640

Claims priority, application Germany, June 9, 1972, 2228112

Int. Cl. C12d *13/10*

U.S. Cl. 195—65 **10 Claims**

1. A process for the microbiological production of invertase which comprises culturing a strain of the microorganism *Saccharomyces carlsbergensis* Hansen CBS 268.72, 269.72 and 270.72 under aerobic conditions in an aqueous nutrient medium.

3,887,435

METHOD OF PRODUCING YEAST CELLS

Junji Nakamura; Shigeyoshi Miyashiro, and Hiroshi Okada, all of Tokyo, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Feb. 7, 1974, Ser. No. 440,291

Claims priority, application Japan, Feb. 14, 1973, 48-18004

Int. Cl. C12c *11/08*

U.S. Cl. 195—82 **6 Claims**

1. A method of producing yeast cells which comprises:

a. culturing a yeast strain capable of assimilating propionate ions and n-butyrate ions in an aqueous culture medium containing propionate ions, n-butyrate ions, or propionate and n-butyrate ions as the principal source of assimilable carbon, as assimilable source of nitrogen, inorganic salts, and minor organic nitrients until the cells of said strain multiply in said culture medium; and

b. recovering the multiplied cells from said medium.

3,887,436

CELL CULTURING SYSTEM

Ihsan A. Haddad, Bedford, and Alvin R. Arsenault, Burlington, both of Mass., assignors to Instrumentation Laboratory, Incorporated, Lexington, Mass.

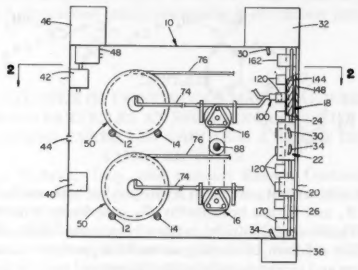
Filed May 31, 1973, Ser. No. 365,535

Int. Cl. C12b *1/00*

U.S. Cl. 195—142 **7 Claims**

1. A replaceable, sterilizable, cell growth assembly compris-

ing a chamber of gas permeable liquid impermeable material having an inner surface to which cells are attachable, and which defines an elongated flow path between inlet and outlet conduits, a coupling connected to said conduits, said coupling including a body member that supports two projecting rigid conduits, each said rigid conduit having an orifice and a puncturing tip adjacent said orifice, a seal member of elastomeric material, said puncturing tips being imbedded in said seal



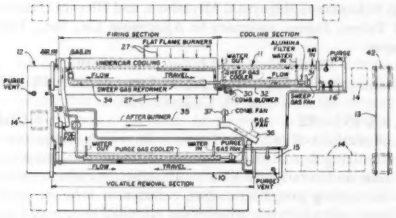
member, and a guide member secured to said seal member and extending parallel to said projecting rigid conduits for sliding movement relative to said body member so that said conduit orifices may be opened by sliding said seal member along said rigid conduits as guided by said guide member to expose the tips of said rigid conduits, said orifices being reclosed by sliding said seal member in the opposite direction away from said body member to reposition said orifices of said rigid conduits in said seal member.

3,887,437

TUNNEL KILN FIRING OF CARBON PRODUCTS

Mohammed A. Osman, and Charles L. Kaib, both of Pittsburgh, Pa., assignors to Pullman Incorporated, Pittsburgh, Pa.

Filed Sept. 20, 1972, Ser. No. 290,576
Int. Cl. C10b *1/00, 7/00, 31/00*
U.S. Cl. 202—117 **12 Claims**



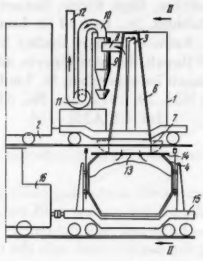
1. Tunnel kiln apparatus especially for firing carbon products, said apparatus comprising a volatiles removal section through which cars laden with "green" carbon ware are moved progressively from an entrance end to an exit end, and a section physically separated from said volatiles removal section and having a firing zone and a cooling zone through which cars transferred from the exit end of the volatiles removal section are successively and progressively moved from an entrance end of said firing zone to an exit end of said cooling zone.

3,887,438

PLANT FOR DISCHARGING COKE FROM HORIZONTAL-FLUE COKE OVEN

Nikolai Konstantinovich Kulakov, ulitsa Danilevskogo 14, kv. 21; Evgeny Petrovich Likhogub, ulitsa Kommunainaya 43, kv. 97; Gersh Abramovich Dorfman, ulitsa Dmitrievskaya 20, kv. 10, and Alexandr Nikolaevich Suslov, ulitsa Karla Marxa, 38e, kv. 42, all of Kharkov, U.S.S.R.

Filed Nov. 16, 1973, Ser. No. 416,630
Claims priority, application U.S.S.R., Nov. 30, 1972, 1851900
Int. Cl. C10b *35/00*
U.S. Cl. 202—262 **2 Claims**



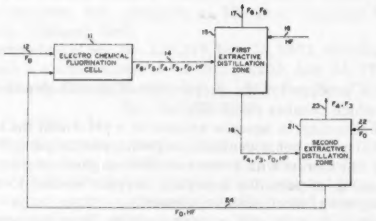
1. A plant for coke discharge from a horizontal-flue coke oven into a coke carrying car, comprising: a door extracting machine; a gas trap provided on the door extracting machine to prevent emission of dust and gas in to the atmosphere during coke discharge into the car; said gas trap having fixed skirt portions depending therefrom which extend below the top edges of the sides of the coke carrying car, said coke carrying car being movable between said skirt portions; pivotable fold plates mounted on the gas trap on either end thereof and extending transverse to said skirt portions, said fold plates adapted to be selectively raised and lowered so that when lowered during coke discharge from the oven these fold plates form together with the skirt portions a bell mouth facing with its wider portion the top of the car and forming an enclosed space together with the car.

3,887,439

SEPARATION OF FLUORINATED DIMETHYL ETHERS BY EXTRACTIVE DISTILLATION

William M. Hutchinson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 25, 1972, Ser. No. 291,615
Int. Cl. B01d *9/00*
U.S. Cl. 203—63 **16 Claims**



1. An extractive distillation process comprising:

passing a first feedstock stream comprising trifluoromethyl difluoromethyl ether (F_5) and dimethyl ether (F_0) into a first extractive distillation zone;

passing a first selective solvent stream comprising anhydrous hydrogen fluoride (HF) into said first extractive distillation zone;

separating and withdrawing from said first extractive distillation zone a first overhead effluent stream comprising trifluoromethyl difluoromethyl ether (F_5); and

separating and withdrawing from said first extractive distillation zone a first bottoms effluent stream comprising dimethyl ether (F_0) and anhydrous hydrogen fluoride (HF).

3,887,440

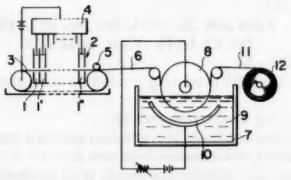
METHOD OF MANUFACTURING A CONTINUOUS MAGNETIC FOIL BY ELECTRODEPOSITION

Satoshi Ichioka, Toda, Japan, assignor to Mishima Kosan Co., Ltd., Kitakyushu, Fukuoka Prefecture, Japan

Filed Jan. 24, 1974, Ser. No. 436,376

Int. Cl. C23b *7/04;* **B23p** *1/00;* **C23b** *5/68*

U.S. Cl. 204—13 **4 Claims**



1. A method of manufacturing a continuous foil of magnetic material by electrodeposition, which comprises electrodepositing a desired magnetic alloy layer on a surface of an endless base conductor belt for electrodeposition in an electrodepositing bath composed of a plurality of electrodeposition chambers, peeling off the resulting deposited layer in a desired thickness, and then subjecting the deposited layer to a continuous electrolytic polishing so as to remove an initially deposited portion, whereby there remains a magnetic foil of uniform composition.

3,887,441

ELECTRO-CHEMICAL SYNTHESIS OF ORGANONICKEL COMPOUNDS

William B. Hughes, and Darryl R. Fahey, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 213,767, Dec. 29, 1971, abandoned, which is a continuation of Ser. No. 59,019, July 28, 1970, abandoned. This application May 25, 1973, Ser. No. 364,031

Int. Cl. C25b *3/00*

U.S. Cl. 204—59 QM **10 Claims**

1. A two-stage process for the synthesis of organonickel catalyst complexes comprising:

subjecting a nickel(II)-phosphine ligand complex to a reducing voltage of from −1.7 to −3.6 volts in the presence of an electrolyte consisting of at least one of a tetraalkyl substituted ammonium halide, nitrate and perchlorate;

contacting the reduced nickel(II)-phosphine ligand complex carried in an organic solvent selected from at least one of acetonitrile, propionitrile, N,N-dimethylformamide, bis(2-methoxyethyl)ether, sulfolane, 1,2-dimethoxyethane, and dioxane with a haloorganic compound selected from the group consisting of pentafluorobromobenzene, hexachlorobenzene, pentachloroiodobenzene, tetrabromomethylene, 2-chlorotoluene, chlorotrifluoroethylene, and pentafluoroiodoethane; and

separating the resulting organonickel catalyst complex.

3,887,442

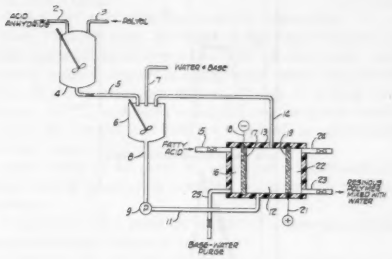
POLYMERIZATION PROCESS

Allan E. Gilchrist, Westlake, Ohio, assignor to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 91,905, Nov. 23, 1970, abandoned. This application Mar. 8, 1971, Ser. No. 122,001

Int. Cl. C07c *29/06;* **C08g** *17/00*

U.S. Cl. 204—72 **2 Claims**



1. In a process for polymerizing resin-forming material that polymerizes into a fluent polymer in contact with a charged electrode surface, the improvement which comprises:

a. establishing and maintaining a reaction mixture in an electrical cell zone having as a boundary area a porous, electrically charged d.c. electrode at least about one thirty-second inch thick, the electroconductive portion of which is formed of a material selected from the group consisting of metals and electroconductive carbon,

said porous electrode having an absolute porosity within the range of about 600 millimicrons to about 200 microns and providing fluid communication between said cell zone and a collection zone,

said reaction mixture comprising said resin-forming material dispersed with electrolyte in an aqueous liquid bath;

b. concentrating, by electrodeposition at said porous electrode, said resin-forming material; and

c. establishing and maintaining a high-to-low pressure gradient between said cell zone and said collection zone, thereby forcing the resulting concentrate through said porous electrode into said collection zone, thus effecting a stage of separation between said concentrate of resin-forming material and the other components of said reaction mixture in said cell zone while electrically stressing said concentrate.

3,887,443

METHOD FOR FORMING A CARBIDE LAYER OF AN ELEMENT SELECTED FROM THE GROUP CONSISTING OF V, NB, TA AND MIXTURES THEREOF ON THE SURFACE OF AN IRON, FERROUS ALLOY OR CEMENTED CARBIDE ARTICLE

Noboru Komatsu, Toyoakeshi; Tohru Arai, and Yoshihiko Sugimoto, both of Nagoyashi, all of Japan, assignors to Kabishiki Kaisha Toyota Chuo Kenkyusho, Aichiken, Japan

Filed Apr. 27, 1973, Ser. No. 355,283

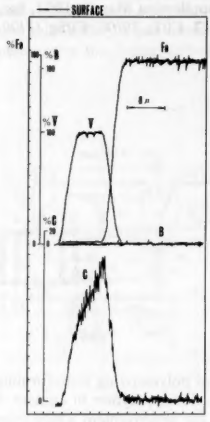
Claims priority, application Japan, May 4, 1972, 47-43729; May 9, 1972, 47-46080; June 8, 1972, 47-56493

Int. Cl. C23b *5/00*

U.S. Cl. 204—39 **14 Claims**

1. A method for forming a carbide layer of an element selected from the group consisting of V, Nb, Ta and mixtures thereof on the surface of an iron, ferrous alloy or cemented carbide article, said article containing at least 0.05 percent by weight of iron, comprising the steps of preparing a treating molten bath composed of molten boron oxide and a substance containing an element selected from the group consisting of V, Nb, Ta and mixtures thereof in a vessel, immersing said article into the treating molten bath, applying an electric current to the treating molten bath, through said article being

used as the cathode for depositing the element on the surface of the article and for forming the carbide layer of said element, with the carbon contained within said article, on the surface of said article, and removing the article from the treating molten bath.



3,887,444

BRIGHT TIN-NICKEL ALLOY PLATING ELECTROLYTE

Shimetomo Fueki; Kazumasa Abe, and Kenji Osawa, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 12, 1974, Ser. No. 460,527
Claims priority, application Japan, Apr. 19, 1973, 48-43776
Int. Cl. C23b *5/38, 5/46*
U.S. Cl. 204—43 S 14 Claims

1. A bright tin-nickel alloy plating electrolyte having a pH in the range from 8 to 12 and consisting essentially of an aqueous main plating liquid containing:

a. a stannous salt selected from the group consisting of stannous pyrophosphate, stannous chloride and stannous sulfate, and which is present in said main plating liquid in an amount between 2 and 20 g/l. calculated as stannous ion;

b. a nickel salt selected from the group consisting of nickel pyrophosphate, nickel chloride and nickel sulfate, and which is present in said main plating liquid in an amount between 5 and 30 g/l. calculated as nickel ion;

c. an alkali-metal pyrophosphate selected from the group consisting of potassium pyrophosphate and sodium pyrophosphate, and which is present in said main plating liquid in an amount between 150 and 600 g/l;

d. at least one brightener additive in said plating liquid in an amount between 0.1 and 100 g/l. of said main plating liquid and being selected from the group consisting of ethylenediamine, 1,2-propanediamine, 1,3-propanediamine, 1,4-butanediamine, pentamethylenediamine, hexamethylenediamine, hydrazine, quanidine, urea and thiourea; and

e. a further additive selected from the group consisting of ammonia and ammonium salts, and in which said further additive is present in said main plating liquid in the amount between 5 and 100 g/l. in the case of ammonia calculated as a 28 percent aqueous ammonia solution, and between 1 and 150 g/l. in the case of ammonium salts.

3,887,445

METHOD FOR THE REDUCTION OF ZINC ION CONCENTRATION AND REMOVAL OF ORGANIC IMPURITIES IN A NEUTRAL OR ACIDIC, AQUEOUS ZINC PLATING BATH

Joseph L. Jackson, Westlake, Ohio, assignor to R. O. Hull & Company Incorporated, Cleveland, Ohio

Filed Apr. 26, 1974, Ser. No. 465,000
Int. Cl. C23b *5/10, 5/12;* B01d *9/00*
U.S. Cl. 204—55 R 5 Claims

1. A method for the reduction of excess zinc ion concentration in an aqueous acid or neutral zinc electroplating bath comprising the steps of, adding to the bath a compound selected from the group consisting of ammonium oxalate, and the combination of oxalic acid and (an amount) about 2.0 equivalents of ammonium hydroxide based on said oxalic acid, to form a zinc precipitate.

3,887,446

ELECTROCHEMICAL PREPARATION OF METALLIC TELLURIDES

William S. McEwan, China Lake, Calif., and Melvin Miles, Murfreesboro, Tenn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 26, 1974, Ser. No. 492,110
Int. Cl. C01b *19/00;* B01k *3/06*
U.S. Cl. 204—86 3 Claims

1. A method for preparing a telluride comprising the steps of:

a. providing a tellurium cathode;

b. providing an anode of a material selected from the group consisting of cadmium, lead and tin;

c. placing said cathode and anode in an ammonium acetate-acetic acid buffer solution from which oxygen is removed and excluded; and

d. passing electrical current through said cathode and anode to generate positive ions at the anode and negative ions at the cathode which combine to form said telluride.

3,887,447

PROCESS OF ELECTROGRAINING ALUMINIUM

Peter Geoffrey Sheasby, and Alan Martin Smith, both of Banbury, England, assignors to Alcan Research and Development Limited, Montreal, Quebec, Canada

Filed Sept. 27, 1973, Ser. No. 401,257
Int. Cl. C23b *3/02*
U.S. Cl. 204—129.4 2 Claims

1. In the process of electrograining aluminum for the production of lithographic printing plates which comprises subjecting the aluminum to alternating current while immersed in an aqueous electrolyte containing 2 – 20 gms/liter hydrochloric acid the improvement which comprises the addition to the electrolyte of 1.5 – 15 gms/liter phosphoric acid whereby to maintain the pit size below about 10 microns in the presence of contaminant sulphate ion in the electrolyte.

3,887,448

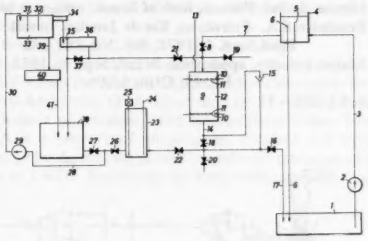
METHOD OF PREVENTING SUPERSATURATION OF ELECTROLYTES WITH ARSENIC, ANTIMONY AND BISMUTH

Reinhold Schulze, Meckerfeld, Germany, assignor to Norddeutsche Affinerie, Hamburg, Germany

Filed Apr. 17, 1973, Ser. No. 352,079
Claims priority, application Germany, Apr. 19, 1972, 2218934. The portion of the term of this patent subsequent to Oct. 3, 1989, has been disclaimed.
Int. Cl. B01d *15/06*
U.S. Cl. 204—130 4 Claims

1. A process for preventing supersaturation of an electrolyte with an impurity selected from the group which consists of arsenic, antimony and bismuth which comprise the steps of:

a. treating said electrolyte with floating particles of a chemisorbent adapted to take up said impurity in an adsorber;
b. draining said electrolyte from said adsorber;
c. circulating a regenerating solution through said adsorber and into contact with said floating particles to strip said impurity therefrom; and



d. electrolytically regenerating said solution along the circulating path thereof; wherein said chemisorbent is stannic acid, said electrolyte is a sulfuric acid electrolyte for the electrolytically refining of copper and said regenerating solution is sulfuric acid more concentrated than said electrolyte.

3,887,449

COATING METHOD AND COMPOSITION FOR THE SACRIFICIAL PROTECTION OF METAL SUBSTRATES

Robert B. Baer, San Antonio, Tex., assignor to Chromalloy American Corporation, New York, N.Y.

Filed May 21, 1973, Ser. No. 362,062
Int. Cl. C23f *13/00*; **C23b** *9/06*; **C23f** *17/00*
U.S. Cl. 204—148 **10 Claims**

1. A method for the sacrificial protection of a metal substrate selected from the group consisting of magnesium and magnesium alloys which comprises,
anodizing said metal substrate to form an adherent oxide film thereon,
applying to said anodized film a first protective coating of a double salt selected from the group consisting of barium potassium chromate and calcium potassium chromate dispersed through a curable adhesive and bonding said coating to said anodized film by curing said adhesive,
providing a second protective coating material comprising a curable adhesive having dispersed therethrough a powdered alloy composition which is electropositive relative to said metal substrate,
said second coating material being electrically conductive relative to said metal substrate,
said powdered alloy composition comprising by weight about 5 to 60 percent of a calcium group metal selected from the group consisting of strontium, barium and calcium, 0 to about 20 percent aluminum and the balance substantially magnesium ranging from about 40 to 95 percent,
and applying and curing a layer of said second coating material to said first protective coating, said second protective coating being sacrificial relative to said metal substrate.

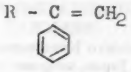
3,887,450

PHOTOPOLYMERIZABLE COMPOSITIONS CONTAINING POLYMERIC BINDING AGENTS

Michael N. Gilano, Fullerton, Calif.; Richard E. Beaupre, West Barrington, R.I., and Melvin A. Lipson, Fullerton, Calif., assignors to Dynachem Corporation, Santa Fe Springs, Calif.

Continuation of Ser. No. 112,797, Feb. 4, 1971, abandoned. This application Dec. 14, 1972, Ser. No. 315,153
Int. Cl. C08f *1/18, 15/16, 15/20, 15/26, 15/38, 19/10*
U.S. Cl. 204—159.15 **15 Claims**

1. A photopolymerizable composition comprising:
A. from 10 to 60 parts by weight of an addition polymerizable material consisting essentially of and being solely one or more non-gaseous compounds, containing at least two terminal ethylenic groups, having a boiling point above 100°C., and being selected from the group consisting of an unsaturated ester of a polyol, an unsaturated amide, and a vinyl ester;
B. from 0.001 to 10 parts by weight of a photo-initiated free-radical generating addition polymerizing initiating system;
C. from 0.001 to 5 parts by weight of a thermal-addition polymerization inhibitor; and
D. from 40 to 90 parts by weight of a preformed macromolecular polymeric binding agent which is a polymer of:
a first monomeric material which contains one or more non-acidic vinyl compounds selected from the group having the general formula:



wherein R is hydrogen, an alkyl group having from 1 to 6 carbon atoms or a halo group; and
a second monomeric material which consists essentially of one or more alpha,beta-unsaturated carboxyl-containing monomers having from 3 to 15 carbon atoms;
wherein the ratio of the first monomeric material to the second monomeric material is sufficient to render the binding agent soluble in a dilute aqueous solution containing from 0.01 to 10 percent of a water-soluble base.

3,887,451

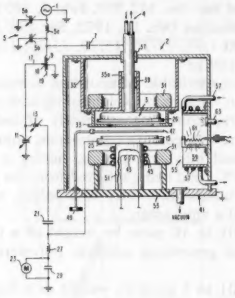
METHOD FOR SPUTTERING GARNET COMPOUND LAYER

Jerome J. Cuomo, Bronx; Ashok F. Mayadas, Somers; Robert Rosenberg, Peekskill, and Varadachari Sadagopan, Scarborough, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1972, Ser. No. 319,589
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 **11 Claims**

9. Method for producing a layer with garnet stoichiometry comprising the steps of
establishing a target which has substantially a garnet stoichiometric composition which is substantially nongarnet structure and establishing a substrate with garnet composition,
radio-frequency sputtering said film onto said substrate from said target including,
establishing operational parameters such that said substrate is at a given temperature approximately in the range of 650°C to 1,000°C, radio-frequency power to said target is at a given power density thereat approximately in the range of 35 watts/sq. in. to 60 watts/sq. in., and radio-frequency bias on said substrate is at a given d.c. level approximately in the range of 200 volts d.c. level to 25 volts d.c. level, and varying interdependently said operational parameters to deposit onto said substrate a layer

having substantially said garnet stoichiometric composition and to establish a given accumulation rate of thickness of said layer on said substrate approximately in the range of 1 Angstrom/sec. to 3 Angstroms/sec.

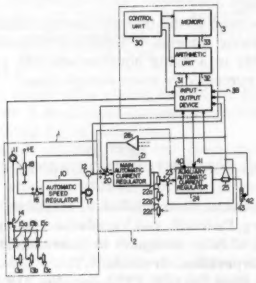


3,887,452

OPTIMUM ELECTROPLATING PLANT CONTROL DEVICE

Toshio Mannaka; Hidehiro Kitanosono, and Shigemichi Matsuka, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 31, 1972, Ser. No. 302,402
Claims priority, application Japan, Nov. 4, 1971, 46-87194
Int. Cl. C23b *5/68;* **B01k** *3/00*
U.S. Cl. 204—211 **6 Claims**



1. An optimum control system for regulating the plating current in and speed of a plating line, said system comprising speed control means for controlling the speed of said plating line, said speed control means including speed detection means for detecting the speed of said plating line,

current control means for controlling the plating current of said plating line, said current control means including current detection means for detecting the plating current of said plating line,

temperature detection means for detecting the temperature of said current control means, and

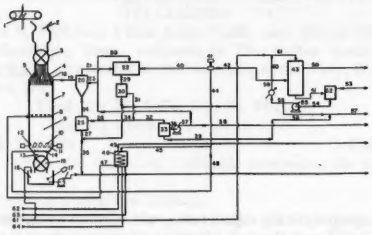
system control means responsive to said detected speed, current and temperature for continuously regulating said speed control means and said current control means in accordance with a predetermined relationship based on the speed, current and temperature of said plating line, whereby the plating current of said plating line is continuously maintained at a level such that the temperature of said current control means is kept immediately below the critical breakdown temperature of said current control means.

3,887,453

PROCESS FOR OBTAINING OIL, GAS AND BYPRODUCTS FROM PYROBITUMINOUS SHALE OR OTHER SOLID MATERIALS IMPREGNATED WITH HYDROCARBONS

Seiki Ueta, Curitiba, Parana, and Osmar Chaves Ivo, Sao Mateus do Sul, Parana, both of Brazil, assignors to Petroleo Brasileiro S.A. -Petrobras, Rio de Janeiro, Brazil

Filed Sept. 1, 1972, Ser. No. 285,692
Claims priority, application Brazil, Sept. 6, 1971, 05857
Int. Cl. C10b *53/06*
U.S. Cl. 208—11 **8 Claims**



1. A non-combustion process for obtaining mineral oil and other derivatives from pyrobituminous shale or other solid materials impregnated with hydrocarbons, the said process being non-combustive and carried out in a vertical distillation retort, wherein the mined shale or other solid materials is continuously fed at the top of said retort through an inert gas sealed valve, wherefrom said mined shale or other solid materials are evenly distributed to the retorting zone and then descend to a cooling zone below the retorting zone, the retorting being carried out at super-atmospheric pressure by a mixture of substantially oxygen-free recycling gases previously and indirectly heated outside the retort, said heated recycling gases being introduced into the bottom of the retorting zone of said retort at a higher temperature than the retorting temperature, and of substantially oxygen-free recycling gases introduced cold at the bottom of said retort into the cooling zone which in upwardly flow through the cooling zone exchange sensible heat with said retorted shale or other solid materials that is continuously withdrawn from the bottom of said retort through an inert gas sealed valve, the liquid and gaseous retorting products being drawn from top of said retort.

3,887,454

LAYERED CLAY MINERALS AND PROCESSES FOR USING

Donald A. Hickson, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 311,080, Dec. 1, 1972, Pat. No. 3,844,978.
This application Mar. 18, 1974, Ser. No. 452,472
Int. Cl. C01b *33/28;* **C10g** *13/02, 11/18*
U.S. Cl. 208—111 **16 Claims**

1. A hydroconversion process comprising contacting a hydrocarbon feedstock at conventional hydroconversion conditions with a catalyst comprising: (1) a layer-type dioctahedral, clay-like mineral, and (2) at least one hydrogenation component, said mineral having prior to dehydrating and calcining of said catalyst, the empirical formula:

$$MgO : sSiO_2 : aAl_2O_3 : bAB : xH_2O$$

wherein the layer-lattice structure is composed of said silica, said alumina, said magnesia, said A and said B, and wherein s is from 1.4 to 100,

a is from 0.1 to 100,

b is from 0.2 to 0.6,

A is one equivalent of an exchangeable cation having a valence of 3 or less and is external to the layers of the framework or at the edges or between successive layers of the structure,

B is chosen from the group of negative ions consisting of F^-, OH^-, $\frac{1}{2}O^{--}$ and mixtures thereof, and is internal or at the edges and surfaces of the layers of the framework structure, and

x is from 2 to 3.5 at 50% relative humidity,

said mineral being characterized by a d_{001} spacing at said humidity within the range which extends from a lower limit of about 10 Angstroms to an upper limit of 18 Angstroms when A is divalent or trivalent, with intermediate values possible when A is a mixture of monovalent, divalent and trivalent cations, and a d_{06} spacing at said humidity in the range of from 1.5176 to 1.4977 Angstroms by X-ray diffraction analysis.

3,887,455

EBULLATING BED PROCESS FOR HYDROTREATMENT OF HEAVY CRUDES AND RESIDUA

Glen P. Hamner, and Kenneth R. Clem, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Mar. 25, 1974, Ser. No. 454,153
Int. Cl. C10g *13/02, 13/14;* **B03d** *3/00*
U.S. Cl. 208—112 **16 Claims**

1. In a process for the hydrotreatment of heavy crudes and residua which contain large quantities of 1050°F.+ hydrobon materials in an ebullating bed of catalyst operated at conditions wherein the catalyst particles are metallized or coked, or both, particles are added to the upper portion of the ebullating bed and catalyst withdrawn from the bottom of the bed, the improvement comprising:

establishing a bed of catalyst solids particles and ebullating said bed by upflow of a metals-containing liquid hydrocarbon feed introduced, with hydrogen, into the bed at velocity sufficient to expand the bed to a volume ranging from about 20 to about 70 percent, as contrasted with the volume of the bed of catalyst wherein the particles thereof are in quiescent state,

introducing a catalyst or precatalyst comprising at least about 50 percent of its total pore volume of absolute diameter within the range of from about 100A to about 300A, and less than about 20 percent of its total pore volume of absolute diameter within the range of 0 to about 100A, a surface area ranging at least about 200 m^2/g to about 600 m^2/g, a pore volume ranging from about 0.8 to about 3.0 cc/g, and a density ranging from about 0.25 to about 0.7 g/cc, into the top of the ebullating bed,

conducting the reaction at conditions characterized as follows,

Temperature, °F. (E.I.T.)	
Start-of-Run	650
End-of-Run	850
Pressure, psi	500–10,000
Hydrogen Rate, SCF/B	3000–20,000
Space Velocity, LHSV	0.2–3.0

to produce stratification and grading of catalyst particles as a result of increased density caused by absorption of coke or metals, or both, in direct relation with catalyst age, the more aged catalyst particles settling to the bottom of the ebullating bed, and

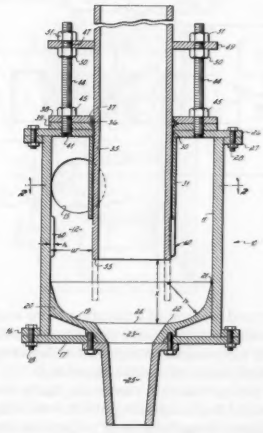
removing stratified catalyst particles from the bottom of the ebullating bed characterized as containing a composite of from about 5 to about 50 percent of a Group VIB metal, or compound thereof, or from about 1 to about 12 percent of a Group VIII metal, or compound thereof, or admixture of both of said Group VIB and Group VIII metals, or compounds thereof, measured as oxides, a porous inorganic oxide support, and having a density at least about 0.1 g/cc greater than the density of the catalyst or precatalyst added to the top of the bed as a result of having absorbed metals or coke, or both, during the reaction.

3,887,456

CLASSIFIER WITH RIFFLERS AND VARIABLE THROAT

James W. Loughner, Rt. No. 1, Box 456 Litton Heights, Scott Depot, W. V-. 25560

Filed Oct. 1, 1973, Ser. No. 402,193
Int. Cl. B04c *5/103*
U.S. Cl. 209—211 **5 Claims**



1. A classifier for separating heavier and lighter fractions in a liquid-borne stream of mixed particles of different densities, said classifier comprising,

a hollow cylindrical body having a wall defining an annular internal chamber,

a bowl at a lower end of said chamber, said bowl curving downwardly and inwardly from the wall of said body to a conical central opening,

an inlet pipe leading to a substantially tangential inlet opening through said wall into said chamber adjacent an upper end of the chamber,

a top cover for said chamber,

an overflow pipe projecting downwardly through said cover and axially into said chamber toward said conical opening, said overflow pipe having an open lower end positioned above said conical opening and below said inlet opening,

and a plurality of rifflers mounted to said wall at angularly spaced positions around said chamber below said inlet opening and above said bowl,

each said riffler being a projection on said wall extending into said chamber and having a generally semicircular cross-sectional shape with gradually inclined leading and trailing surfaces thereon,

each riffler extending angularly with respect to the direction of fluid flow over said wall between said inlet opening and said central opening,

the dimension of said rifflers in the direction across the radius of said chamber being no greater than about one-third the diameter of the largest particles to be separated, said rifflers in use of said classifier jigging liquid-borne material passing over them and thereby releasing lighter particles entrapped by heavier particles so that such lighter particles move inwardly with respect to the heavier particles while said heavier particles continue to move over said wall.

3,887,457

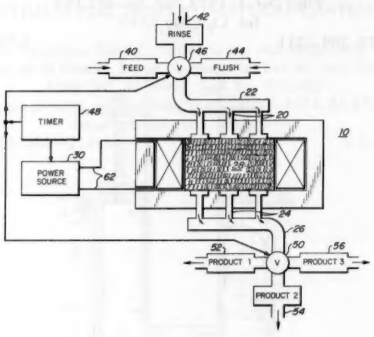
MAGNETIC SEPARATION METHOD

Peter G. Marston, Gloucester; Ionel Wechsler, Farmingham, and John J. Nolan, Randolph, all of Mass., assignors to Magnetic Engineering Associates Inc., Cambridge, Mass.

Filed May 21, 1973, Ser. No. 362,218

Int. Cl. B03c 1/24

U.S. Cl. 209—214 **6 Claims**



1. An improved method of separating more-magnetic particles from less-magnetic particles contained in a fluid medium which reduces mechanical entrapment of less-magnetic particles by more-magnetic particles comprising:

submitting a fluid medium containing both more-magnetic particles and less-magnetic particles to a ferromagnetic matrix having a multiplicity of collection sites; and

simultaneously subjecting the more-magnetic particles and the less-magnetic particles, as they move through said matrix, to a time varying magnetic field whose intensity in said matrix varies, from a predetermined intensity sufficient to induce a high magnetic field gradients at said collection sites and to induce magnetic dipole moments in the more-magnetic particles to adhere the more-magnetic particles having induced magnetic dipole moments to said collection sites having high magnetic field gradients, some of the less-magnetic particles being entrapped between two or more more-magnetic particles or between one or more more-magnetic particles and a said collection site, to a lower intensity sufficient to reduce the high magnetic field gradients induced at said collection sites and reduce the induced magnetic dipole moment in said more-magnetic particles below the level required for said more-magnetic particles to adhere to each other and to said collection sites to free entrapped less-magnetic particles;

said time varying magnetic field reaching said predetermined intensity at a collection site more than once and decreasing below that predetermined intensity at least once during each matrix transit period during which more-magnetic and less-magnetic particles are simultaneously being fed to said matrix.

3,887,458

PERMANENT MAGNET STRONG FIELD SEPARATOR

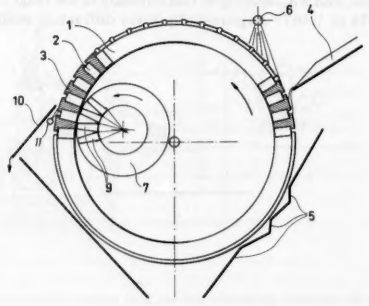
Erkki A. Laurila, Helsinki, Finland, assignor to Bermeco Oy, Helsinki, Finland

Filed May 21, 1973, Ser. No. 362,305

Claims priority, application Finland, May 26, 1972, 1486/72

Int. Cl. B03c 1/12

U.S. Cl. 209—219 **10 Claims**



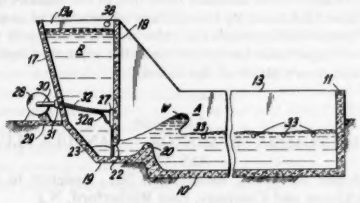
1. A permanent magnet separator particularly for separating weakly magnetic materials from non-magnetic materials, comprising:

a first hollow rotating cylinder, having inner and outer surfaces, composed of a plurality of substantially rectangular solid permanent magnets each arranged in a parallel relation to the side line of said cylinder and a plurality of pole pieces each substantially identically shaped and spaced intermediate said permanent magnets, thereby forming on said inner surface alternate substantially parallel sections consisting of said magnets and pole pieces, said permanent magnets being alternately reversely magnetized; and

shunting means, including a separate rotating multipole permanent magnet eccentrically mounted within said first cylinder, for shunting the magnetic field of said pole pieces of said first cylinder by cooperation between said shunting means and said pole pieces of said first cylinder as said pole pieces of said first cylinder come into a certain position in relation to said shunting means;

said separate permanent magnet comprising a second rotating cylinder with alternating reversely magnetized permanent magnets and pole pieces in which the distance between the magnetic pole pieces is the same as the distance between the magnetic pole pieces of said inner surface and wherein the remanent flux of said permanent magnets on said second cylinder is greater than the remanent flux of said permanent magnets on said first cylinder, said second cylinder being synchronized with said first cylinder so that said magnetic pole pieces thereof always face oppositely magnetized pole pieces on said first cylinder at said certain position.

3,887,459
PROCESS FOR TREATING WATER
Minor E. McLaughlin, Newfane, Vt., assignor to Economic Development Corporation, Newfane, Vt.
Division of Ser. No. 230,424, Feb. 29, 1972, Pat. No. 3,823,767. This application Feb. 25, 1974, Ser. No. 445,230
Int. Cl.[2] C02C *1/02*
U.S. Cl. 210—8 **15 Claims**

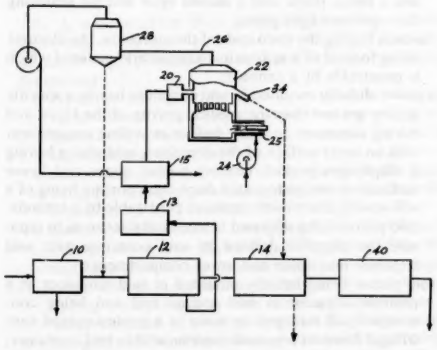


2. The method of treating sewage in accordance with claim **1** including the step of agitating the sewage by means of a series of baffle-like projections to increase the amount of oxygen therein and to precipitate out the activated sludge.

3,887,460
SELECTIVE ION EXCHANGE RESINS
Christopher John Ward; Cyril Alfred Morgan, both of Chadwell Heath, and Richard Paul Allen, Surbiton, all of England, assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.
Filed June 1, 1973, Ser. No. 365,909
Int. Cl. C02b *1/56*
U.S. Cl. 210—37 **7 Claims**

1. The method of removing boron and arsenic anions from an aqueous solution having at least one of said anions dissolved therein which comprises contacting said aqueous solution with a cross-linked hydroxyaryl polymer having tetrahedral boron anion-receiving sites formed by polymerization of a pre-formed complex of a hydroxyaryl compound and boron anion with a formaldehyde source and leaching the formed polymer with an acid which is effective in removing said boron anion and providing said boron anion-receiving sites.

3,887,461
MAKING ACTIVE CARBON FROM SEWAGE SLUDGE
Robert D. Nickerson, Riverside, Conn., and Henry Cashel Messman, Larchmont, N.Y., assignors to Combustion Engineering, Inc., Windsor, Conn.
Continuation-in-part of Ser. No. 141,896, May 10, 1971, abandoned. This application Apr. 16, 1973, Ser. No. 351,685
Int. Cl. G02c *3/00*
U.S. Cl. 210—39 **4 Claims**

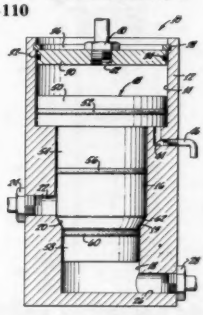


1. A method of treating sewage including the steps of subjecting the sewage to primary treatment which includes allowing solids to settle out in a settling tank, conveying the solids to a furnace, subjecting the solids to pyrolitic treatment in the furnace at temperatures within the range of 500°C–1000°C by passing a stream of hot gases therethrough, to form active carbon and char, separating the active carbon from the char by entraining it in the gases leaving the furnace, separating the active carbon from the gases, and introducing the active carbon into the settling tank to act as an adsorbent.

3,887,462
DISPOSAL OF WASTE STREAMS CONTAINING ASBESTOS
Thomas F. Lagess, and Valroy Henry Maudlin, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.
Filed June 7, 1974, Ser. No. 477,241
Int. Cl. C02b *1/20*
U.S. Cl. 210—53 **10 Claims**

1. A method of safe disposal of asbestos-containing aqueous waste material, which comprises admixing a finely divided, relatively dense, substantially insoluble settling agent to said asbestos-containing aqueous waste material, and conveying the mixture to an underground cavity.

3,887,463
REVERSE OSMOSIS SYSTEM WITH AUTOMATIC VALVE FOR MODULE OPERATION CONTROL
Donald T. Bray, Escondido, Calif., assignor to Desalination Systems, Inc., Escondido, Calif.
Filed Feb. 6, 1974, Ser. No. 439,868
Int. Cl. B01d *31/00*
U.S. Cl. 210—110 **7 Claims**



1. A reverse osmosis water purification system comprising a module containing a semipermeable membrane and having an inlet for introduction of pressurized feed water thereinto, means for releasing concentrate from said module, means for transferring purified water produced by said module into a storage container and for maintaining said purified water in said storage container under elevated pressure, means for dispensing purified water from said container, and an automatic valve for controlling the introduction of pressurized feed water into said inlet of said module thereby to regulate the pressure of the purified water under elevated pressure in said storage container, in which the improvement comprises:

a. said automatic valve comprising a body having a first internal cavity having a movable seal spanning its effective cross sectional area and having a connection above said movable seal communicating with said storage container;

b. said body having a central internal cavity communicating with said inlet for introducing pressurized feed water into said module, and having a movable seal spanning its effective cross sectional area operatively connected to said movable seal spanning said first internal cavity, the effective cross sectional area of said central internal cavity being less than the effective cross sectional area of said first internal cavity;

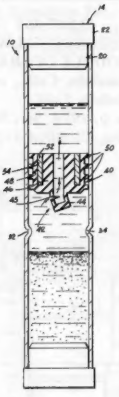
c. said body having a third internal cavity connected to a supply of pressurized feed water for said module and having an opening leading to said central internal cavity, said opening being of area smaller than the effective cross sectional area of said central cavity, and a movable seal operatively connected to the movable seal in said central internal cavity and adapted to close the opening leading from said third internal cavity to said central internal cavity when the pressure above said movable seal in said first internal cavity is above a first predetermined pressure and adapted to open the opening leading from said third internal cavity to said central internal cavity when the pressure above said movable seal in said first cavity is below a second predetermined pressure which is below said first predetermined pressure.

3,887,464

SERUM/PLASMA SEPARATOR WITH CENTRIFUGAL VALVE SEAL

Waldemar A. Ayres, Rutherford, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Feb. 27, 1974, Ser. No. 446,359
Int. Cl. B01d *21/26*
U.S. Cl. 210—117 **5 Claims**



1. A self-contained fluid separator assembly, capable of separating blood into its component parts of light phase plasma or serum and heavy phase cellular portion, comprising:

a. a container having at least one open end which is adapted to receive blood for subsequent separation into a light phase and a heavy phase;

b. a closure sealing the open end of the container, the closure being formed of a self-sealing elastomeric material which is penetrable by a cannula through which blood to be separated is conducted into the container;

c. a piston having a specific gravity relatively greater than the cellular portion of the blood and slidably mounted in the container and having means on an outer surface in sealing engagement with an inner surface of the container;

d. centrifugally actuated valve means associated with said piston, said valve means being in the form of a downwardly projecting distortable closed end tube with a side slit and having a specific gravity greater than blood said slit openable when the valve means distorts due to substantial centrifugal force acting upon it, said valve means being normally closed when there is a minimum of centrifugal force acting on the valve means, so that when said container is subjected to moderate centrifugal force the blood separates into its light phase and heavy phase but the piston stays in the upper portion of the container, and subsequently when increased centrifugal force is used the valve means automatically opens with the light phase passing up through the valve means enabling the piston to move down through the light phase while retaining sealing engagement with the inner surface of the container; and

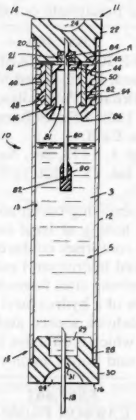
e. mechanical stop means on the container whereby the piston when moving through the light phase will stop a predetermined distance from one of the ends of the container followed by termination of substantial centrifugal force which permits the valve means to close to provide an impervious barrier between the separated light phase and heavy phase of the blood.

3,887,465

SERUM/PLASMA SEPARATOR — CANNULA FLUID BY-ASS TYPE

Waldemar A. Ayres, Rutherford, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Feb. 27, 1974, Ser. No. 446,384
Int. Cl. B01d *21/26*
U.S. Cl. 210—130 **3 Claims**



1. A self-contained fluid separator assembly capable of separating blood into its component parts of light phase plasma or serum, and heavy phase cellular material, comprising:

a container having a first open end which is adapted to receive blood for subsequent separation into a light phase and a heavy phase and a second open end for removing the separated light phase;

closures sealing the open ends of the container, the closures being formed of a self-sealing elastomeric material which is penetrable by a cannula;

a piston slidably mounted in said container having a specific gravity greater than the specific gravity of the blood and having means on an outer surface in sealing engagement with an inner surface of the container, said piston having a diaphragm portion forming partial upper and lower surfaces of said piston, said diaphragm portion being of a self-sealing elastomeric material penetrable by a cannula; said piston being disposed in said container so as to separate the chamber defined by said container with said closures, into upper and lower compartments;

said piston being initially mounted in said container at a position adjacent to said second end and being constructed and arranged to move at a predetermined centrifugal force to a second position within said container, whereby said upper compartment is expanded in volume and said lower compartment is reduced in volume;

a tube of pre-determined length having one end fixed to the closure for said second end and one end free, terminating within said chamber, said tube having an opening into said chamber at the terminal free end and an opening into said upper compartment at the fixed end;

seal means closing said opening at the terminal, free end of said tube, said seal means being constructed and arranged to disengage from said tube at said predetermined centrifugal force;

said piston in its initial position cooperating with said tube, so that said tube pierces the diaphragm portion of said piston, whereby said tube together with said seal means forms a closed conduit through said piston, and whereby upon disengaging of said seal means by centrifugal force, communication between said upper and lower compartments is established, said piston in its second position being removed from cooperation with said tube, whereby said conduit is terminated and the diaphragm portion of said piston previously pierced by said tube is self-sealed.

3,887,466

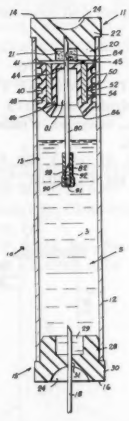
SERUM/PLASMA SEPARATOR CANNULA FLUID BY-PASS TYPE CENTRIFUGAL VALVE CANNULA SEAL

Waldemar A. Ayres, Rutherford, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Feb. 27, 1974, Ser. No. 446,385

Int. Cl. B01d *21/26*

U.S. Cl. 210—131 **4 Claims**



1. A self-contained fluid separator assembly capable of separating blood into its component phases of plasma and serum, the light phase, and cellular material, the heavy phase, comprising:

a container having a first open end which is adapted to receive blood for subsequent separation into a light phase and a heavy phase and a second open end for removing the separated light phase;

closures sealing the open ends of the container, the closures being formed of a self-sealing elastomeric material which is penetrable by a cannula;

a piston slidably mounted in said container, having a specific gravity greater than the specific gravity of the blood and having means on an outer surface in sealing engagement with an inner surface of the container, said piston having a diaphragm portion forming partial upper and lower surfaces of said piston, said diaphragm portion being of a self-sealing elastomeric material penetrable by a cannula; said piston being disposed in said container so as to separate the chamber defined by said container with said closures, into upper and lower compartments;

said piston being initially mounted in said container at a position adjacent to said second end and being constructed and arranged to move at a predetermined centrifugal force to a second position within said container, whereby said upper compartment is expanded in volume and said lower compartment is reduced in volume;

a tube of pre-determined length having one end fixed to the closure for said second end and one end free, terminating within said chamber, said tube having an opening into said chamber at the terminal free end and an opening into said upper compartment at the fixed end;

centrifugal valve means normally closing said opening at the terminal, free end of said tube and constructed and arranged to open under said predetermined centrifugal force; and

said piston in its initial position cooperating with said tube, so that said tube pierces the diaphragm portion of said piston, whereby said tube together with said valve means forms a closed conduit through said piston, and whereby upon opening of said valve means by centrifugal force, communication between said upper and lower compartments is established, said piston in its second position being removed from cooperation with said tube, whereby said conduit is terminated and the diaphragm portion of said piston previously pierced by said tube is self-sealed.

3,887,467

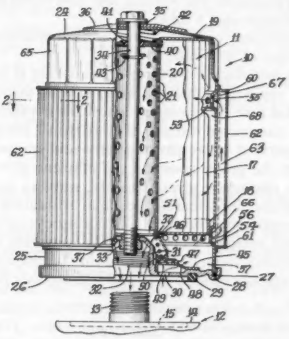
OIL COOLER AND FILTER CONTAINER FOR ENGINE

Andrew L. Johnson, 5346 Greenleaf, Skokie, Ill. 60076

Filed Oct. 1, 1973, Ser. No. 402,471

Int. Cl. B01d *35/18*

U.S. Cl. 210—186 **8 Claims**



1. In an oil filter apparatus for an internal combustion engine or the like, which apparatus includes a filter, a case about said filter, said case includes means whereby the oil is directed to flow in a path with the filter being transverse to a first part of said path so that the oil normally flows through the filter, the improvement comprising:

said means including a first wall about at least part of the periphery of the case and a second wall within said first wall, said walls defining a space therebetween which space is a second part of said path, said filter being within said second wall, said first wall including fin means to increase the heat transfer area of the wall, said fin means being in the form of corrugations in the first wall thereby increasing the surface area on both the interior and exterior of the wall,

said filter being a replaceable cartridge filter having two ends, said second wall having two inwardly extending annular bands with spaced openings through the bands, said first wall covering said bands, said case having means positioning said filter in a given location in said case such that said path and the openings in one band are beyond one end of the filter, said case being in separable parts with the line of separation extending other than through

said first wall whereby access may be obtained to the interior of the case for replacement of the filter.

3,887,468

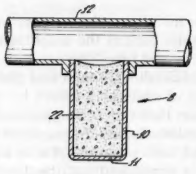
FEED WATER CHLORINATOR FOR A REVERSE OSMOSIS SYSTEM

Donald T. Bray, Escondido, Calif., assignor to Desalination Systems, Inc., Escondido, Calif.

Continuation-in-part of Ser. No. 352,506, April 19, 1973, abandoned. This application Aug. 16, 1974, Ser. No. 497,840

Int. Cl. C02b *3/06*

U.S. Cl. 210—206 **9 Claims**



1. In apparatus for treatment of a solution by a semipermeable membrane process and which comrises a module containing a semipermeable membrane, means for introducing feed water under pressure into said module, means for releasing purified water from said module, and means for releasing concentrate from said module; in which the improvement comprises:

a. said means for introducing said feed water into said module comprising a pipe;

b. a receptacle connected into and communicating with the interior of said pipe;

c. said receptacle enclosing a tube having at least one open end exposed to the feed water flowing through said pipe;

d. said tube containing a bactericide consisting essentially of a compacted mixture of more than 2 percent and up to 10 percent by weight of a fatty acid compound selected from the group consisting of ethylene glycol monostearate, diethylene glycol stearate, sorbitan monopalmitate, sorbitan monostearate, sorbitan tristearate and glyceryl monostearate, balance a chloroisocyanuric acid compound selected from the group consisting of sodium dichloroisocyanurate, potassium dichloroisocyanurate, dischlroisocyanuric acid and trichloroisocyanuric acid.

3,887,469

LUBRICATING OIL FILTERING DEVICE

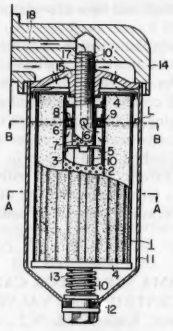
Masazi Hayashi, No. 23-9, 1-chome, Nishi-shinbashi, Minato-ku, Tokyo, Japan

Filed Aug. 9, 1973, Ser. No. 386,993

Int. Cl. B01d *35/06*

U.S. Cl. 210—223 **3 Claims**

1. In an oil filter, an outer casing formed with an inlet through which oil to be filtered enters said casing, a pair of concentric perforated cylinders in said casing, said cylinders having different diameters and defining between themselves an elongated annular space, filter means situated in said casing in the path of flow of oil from said inlet through one of said cylinders to said annular space for filtering the oil prior to the time when the oil reaches said annular space, said cylinders and the common axis thereof being upright during use of the filter, and outlet means for discharging oil from said casing, said outlet means communicating through the other of said perforated cylinders with said annular space at a predetermined elevation along the common axis of said cylinders, and ring-shaped magnet means situated in said annular space at said predetermined elevation therein for acting magnetically on particles in oil flowing to said outlet means through the other of said cylinders, whereby particles remaining in the oil in said annular space flowing toward said outlet means which respond to magnetism will be retained by said magnet means before reaching said outlet means, said cylinders including inner and outer cylinders respectively having outer and inner surfaces between which said annular space is defined, said filter means surrounding said outer cylinder and said outlet means communicating with the interior of said inner cylinder,



said ring-shaped magnet means including an intermediate magnetic ring and a pair of magnetic end plates respectively engaging upper and lower end surfaces of said ring and projecting radially beyond the inner and outer peripheries of said ring to define a pair of circumferential channels respectively directed toward the inner and outer surfaces of said outer and inner cylinders.

3,887,470

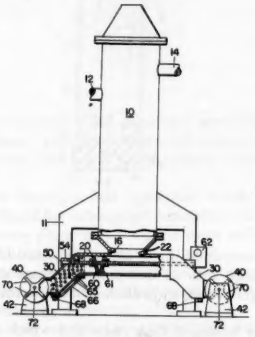
WASTE REMOVAL SYSTEM

Roland E. Weber, Holyoke, and Carl J. Zimmermann, Belchertown, both of Mass., assignors to Industrial Pollution Control Corp., Ware, Mass.

Filed Oct. 31, 1973, Ser. No. 411,247

Int. Cl. B01d *25/38*

U.S. Cl. 210—261 **1 Claim**



1. In anti-pollution apparatus incorporating a settling tank inclusive of an upper work area where a mainly liquid fraction is separated from a mainly heavier solid fraction with the liquid fraction being charged outwardly of the upper area and a lower work area where the solid fraction is charged downwardly thereinto from the upper work area and a lowermost discharge opening leading from the lower work area,

the improvement in means for the compacting of the solid fraction and the expression of fluent material therefrom comprising:

a horizontally-extending housing having a hollow interior of rectangular configuration in cross section and an uppermost central receiving opening in direct communication with the lowermost discharge opening of the settling tank and having an outlet at each opposite outboard extremity,

a pair of spaced parallel drive screws journalled at opposite ends of the housing and being extendable through and centrally of the housing interior,

a pair of angularly-and-oppositely-disposed compacting ram heads in threaded engagement with the drive screws for reciprocation in alternating in seriatim compacting strokes between the opposite outlets of the housing,

each compacting ram head having an outboard compacting face and an inboard non-compacting face and a plurality of tapered passages therethrough with each passage being smaller on the outboard compacting face than on the inboard non-compacting face,

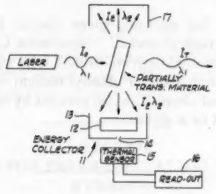
drive means for unisonly driving the drive screws in a manner for effecting the in seriatim compacting movements of the compacting ram heads, an adjacently-disposed dehydrating chamber having upper open and lower open ends and being positioned at each end of the housing communicating at its upper open end with and inclining vertically below and away from the respective outlet for receiving a compacted charge of the solid fraction from within the housing during and upon the completion of each respective compacting stroke of the respective compacting ram head, inclined drum-shaped release means for the removal of fluent material expressed from each compacted charge of the solid fraction charged into each dehydrating chamber,

a horizontally-disposed drum-shaped residue receptacle communicating with the lower open end of each dehydrating chamber, means within said receptacle for the intermittent collection and removal of the charges of the solid fraction charged thereinto from the housing and respective dehydrating chamber and being rotated for the in-seriatim dumping of a compacted charge of the solid fraction from one compartment while a next-following compartment is being charged.

3,887,471
TRANSMITTING POWER METER FOR MEASUREMENT OF RADIATION

Suzanne C. Stotlar, Garretsville, Ohio, assignor to Kewanee Oil Company, Bryn Mawr, Pa.

Filed Feb. 19, 1974, Ser. No. 443,345
Int. Cl. G01t 1/16
U.S. Cl. 250—338 **9 Claims**



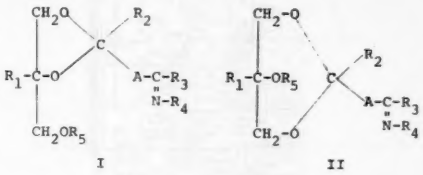
1. A transmitting power meter for measuring the energy level of radiant energy comprising in combination, a partially transmitting crystalline mass of material having a preselected coefficient of absorption sufficient to generate a sensible thermal signal within said crystalline mass with the wavelength of radiation to be measured, and, responsively disposed in spaced apart relationship therewith, a thermal sensor for sensing and measuring said thermal signal generated within said crystalline mass when said radiant energy is intercepted by said crystalline mass.

3,887,472
CYCLIC OXIME DERIVATIVES

Peter Kirby, Maidstone; Eirlys R. Isaac, Stittingbourne, and Graham C. Smith, Ramsgate, all of England, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 24, 1972, Ser. No. 309,566
Claims priority, application United Kingdom, Nov. 29, 1971, 55319/71
Int. Cl. C07d *15/04, 13/08, 13/02*
U.S. Cl. 260—340.7 **7 Claims**

1. An oxime of one of the following isomeric formulae:



wherein R_1 and R_2 each is alkyl of 1–6 carbon atoms; R_3 is a hydrogen atom or alkyl or alkoxycarbonyl each of up to 6 carbon atoms or phenyl, or R_2 and R_3 together represent polymethylene of up to 5 carbon atoms; R_4 is hydroxy or a sodium salt thereof, alkoxy of 1–6 carbon atoms optionally substituted by cyano, by alkoxy or alkoxycarbonyl each of up to 6 carbon atoms, or by N-phenylcarbamoyl, alkynyloxy or alkanoyloxy each of up to 6 carbon atoms, carbamoyloxy mono-N-substituted by alkyl or alkenyl each of up to 6 carbon atoms, or by dihalophenyl, benzyloxy, amino substituted by two alkyls each of 1–6 carbon atoms or by thiocarbamoyl, benzoyl or dinitrophenyl; R_5 is benzyl optionally substituted by two chlorine atoms or by alkyl of 1–6 carbon atoms; and A is a covalent bond or is methylene.

3,887,473
METHOD AND SYSTEM FOR THE INFRARED ANALYSIS OF GASES

Stanley P. Sternberg, Ypsilanti; James E. Young, Detroit, and John W. Lennington, Ypsilanti, all of Mich., assignors to Bergishagen & Associates, Mich.

Division of Ser. No. 281,958, Aug. 18, 1972, Pat. No. 3,790,798, which is a continuation-in-part of Ser. No. 178,260, Sept. 17, 1971, which is a continuation-in-part of Ser. No. 809,752, March 24, 1969, abandoned. This application Nov. 29, 1973, Ser. No. 420,305
Int. Cl. G01n *21/26*
U.S. Cl. 250—345 **6 Claims**

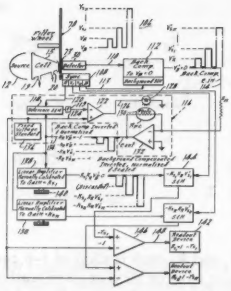
1. A spectrophotometer for analyzing a fluid to determine the concentration of a component therein comprising:

means providing a component signal which is related to the concentration of a component of said fluid;

means providing a reference signal;

means for determining a ratio of said component signal with respect to said reference signal including amplifying means having an input terminal for sequentially receiving said component signal and said reference signal, and an output terminal providing a component ratio signal representative of said ratio of said component signal with respect to said reference signal, variable transfer means connected between said input terminal and said output terminal to provide a feedback signal at said input terminal, means for providing a standard signal means for determining the difference between said standard signal and said signal at said output terminal and for providing a difference signal representative thereof, and means for adjusting said variable transfer means in accordance with

said difference signal when said reference signal is received at said input terminal so that said signal at said output terminal is adjusted by said feedback signal to approach said standard signal in value when said reference signal is received at said input terminal, said feedback signal remaining substantially constant when said component signal is received by said input terminal, whereby said component ratio signal is provided at said output terminal; and



means for subtracting said standard signal from said component ratio signal to provide a component concentration signal having a magnitude of zero when there is no concentration of said component and having a magnitude greater than zero representing the concentration of said component when there is a concentration of said component.

3,887,474

PROCESS FOR PRODUCING A FILLER FOR DRILLING MUD

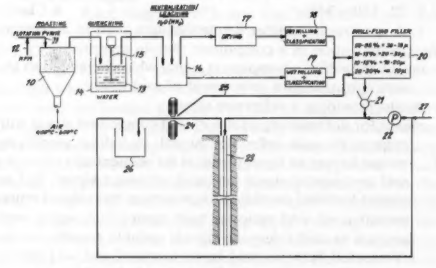
Heinz Senfe, Cologne-Stammheim; Artur Bergmann, Lennestadt; Gerhard Dam, Stommeln, and Dieter Menzel, Rheinkamp-Baerl, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 3, 1972, Ser. No. 277,659

Claims priority, application Germany, Aug. 10, 1971, 2139952; June 22, 1972, 2230510; June 23, 1972, 2230908; June 21, 1972, 2230272

Int. Cl. C09k *3/00*

U.S. Cl. 252—8.5 B **9 Claims**



1. A process for producing a filler for drilling fluids, comprising the steps of:

roasting an iron-and-sulphur-containing mineral mass to produce iron oxide solids containing less than 2 percent by weight sulphur;

quenching the roasted solids from a temperature above 200°C in water to a temperature below 100°C;

excluding any oxidizing atmosphere from the roasted solid during the quenching thereof;

leaching and washing the quenched solids with water to remove water soluble components therefrom; and

milling and classifying said solids to a particle size distribution below 75 microns, with no more than 50 percent of the particles thereof having a particle size below 10 microns to consititute said filler said solids are classified to a particle size distribution in the ranges of substantially:

50 to 55 percent = 30 to 75 microns

10 to 15 percent = 20 to 30 microns

10 to 15 percent = 10 to 20 microns

20 to 30 percent = up to 10 microns.

3,887,475

SOFTENING AGENT FOR TEXTILES HAVING A TETRAHYDROPYRIMIDINIUM SALT COMPONENT

Ulrich Cuntze, Hofheim, Taunus; Adolf May, Diedenbergen, Taunus, and Eckhard Milewski, Schwalbach, Taunus,, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

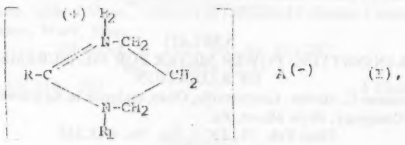
Filed Mar. 1, 1973, Ser. No. 337,195

Claims priority, application Germany, Mar. 2, 1972, 2210085

Int. Cl. D06m *13/36*

U.S. Cl. 252—8.8 **4 Claims**

1. Fluid concentrates of softeners for textiles, which contain as essential components about 50 to 80 percent by weight of tetrahydropyrimidinium salts of the formula I



in which R represents alkyl or alkenyl of 7 to 21 carbon atoms, R_1 represents alkyl or alkenyl of 8 to 22 carbon atoms or an N-acylaminopropyl radical of the formula (II)

$$—CH_2—CH_2—CH_2—NH—CO—R \qquad (II)$$

in which R has the meaning given above, R_2 represents a methyl or ethyl radical and $A^{(-)}$ represents $Cl^{(-)}$ or $R_2—O-SO_3^{(-)}$, which tetrahydropyrimidinium salts of the formula I contain at least one alkyl or alkenyl radical of more than 14 carbon atoms, and about 20 to 50 percent by weight of a lower aliphatic alcohol or a glycol.

3,887,476

QUATERNARY AMMONIUM DERIVATIVES OF BISIMIDAZOLINE COMPOUNDS FOR USE AS FABRIC SOFTENERS

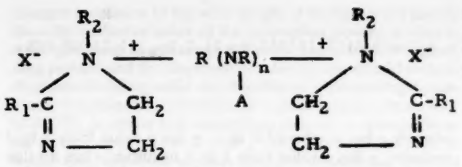
Robert B. McConnell, Janesville, Wis., assignor to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 379,574, July 16, 1973, Pat. No. 3,855,235. This application Sept. 16, 1974, Ser. No. 506,218

Int. Cl. D06m *13/46*

U.S. Cl. 252—8.75 **5 Claims**

1. A fabric softener concentrate in the form of a dispersion containing from 65–85 wt.% of a quaternary ammonium compound having the formula;



wherein R_1 is a $C_5 - C_{23}$ hydrocarbyl group; n is an integer of from 0 – 4; R_2 is lower alkyl; R is a $C_2 - C_4$ alkylene group; A represents hydrogen or an acyl group of the formula $R_1C(O)$ — in which R_1 has the meaning as aforesaid; and X represents a chloro or a lower alkyl sulfate anion and correspondingly from 35–15 wt. % of a lower alkanol.

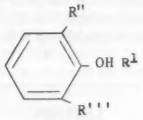
3,887,477

ALKYL PHENOL-HYDRAZINE ANTIOXIDANTS

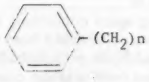
Armand Edward Brachman, Allentown, and Edward Michael McCarron, Easton, both of Pa., assignors to GAF Corporation, New York, N.Y.

Filed May 23, 1972, Ser. No. 282,910
Int. Cl. C08f *45/58*
U.S. Cl. 252—400 R **8 Claims**

1. A composition for stabilizing organic polymers against the deleterious effects of oxygen, heat and light comprising a substantially colorless mixture of hydrazine or hydrazine hydrate and a hindered alkyl phenol having the following formula:



wherein R′ is alkyl containing up to 24 carbon atoms or an aliphatic aryl group having the formula:



wherein *n* has a value of from 1 to 10; R″ is t-butyl t-amyl or isopropyl and R‴ is the same as R″ or ethyl, propyl, butyl, amyl or hydrogen.

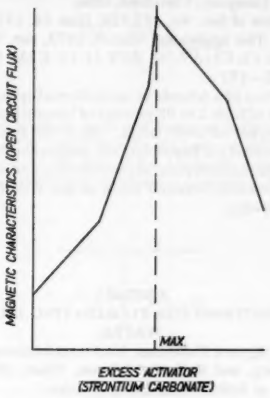
3,887,478

PROCESS FOR PRODUCING ALKALINE EARTH FERRITES

Gordon Cunningham Eadie, Wentwood, England, assignor to British Steel Corporation, London, England

Filed Apr. 19, 1971, Ser. No. 135,031
Claims priority, application United Kingdom, Apr. 20, 1970, 18858/70
Int. Cl. C04b *35/26*
U.S. Cl. 252—62.63 **14 Claims**

1. A process for producing a ferrite magnetic material of the cubic, hexagonal magnetoplumbite or garnet type comprising mixing with solid, particulate, impure ferric oxide having an Fe_2O_3 content between 55 and 96% derived from a process involving iron or steel making or working, an activator in powder form capable of reacting with the ferric oxide to impart to it the required magnetic characteristics selected from the group consisting of compounds of barium, strontum and lead the amount of activator being in sufficient excess of that normally required to react with ferric oxide alone to neutralize or compensate for impurities whereby to render the



impurity incapable of degrading the magnetic characteristics of the ferrite, sintering the mixture at a temperature effective to produce the ferrite material, and grinding the sintered material to the required particle size.

3,887,479

PROCESS FOR PREPARATION OF FERRITES

Joseph H. McLain, Chestertown, Md., assignor to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 30, 1973, Ser. No. 411,105
Int. Cl.[2] C04B *35/36, 35/26;* **C01G** *49/00*
U.S. Cl. 252—62.64 **12 Claims**

1. A process for forming a metallic ferrite comprising:

a. forming a solution of ferrous sulfate and a metallic sulfate in water acidified with sulfuric acid, wherein the mole ratio of ferrous sulfate to metallic sulfate varies from 1:1 to 4:1, and wherein the metallic sulfate is selected from the group consisting of nickel sulfate, manganese sulfate, copper sulfate, magnesium sulfate, zinc sulfate and a mixture of manganese sulfate and magnesium sulfate;

b. evaporating the solvent to form a mixed sulfate crystal;

c. recovering the mixed sulfate crystal;

d. heating the mixed sulfate crystal to form a metallic ferrite.

3,887,480

DETERGENT COMPOSITIONS AND METHODS OF MAKING AND USING THEM

Larry M. Rue, Inver Grove Heights; Richard E. Freis, and Oliver A. Ossanna, both of Bloomington, all of Minn., assignors to Economics, Laboratory, Inc., St. Paul, Minn.

Continuation of Ser. No. 287,479, Sept. 8, 1972, abandoned. This application June 24, 1974, Ser. No. 482,146
Int. Cl. C11d *3/04*
U.S. Cl. 252—135 **10 Claims**

1. A dishwashing detergent or laundry detergent composition comprising detergent ingredients and, in combination therewith, the following water conditioning agent for said detergent composition:

a polymer consisting essentially of: (a) 35 – 70 mole % maleic monomer; (b) 20 – 45 mole % vinyl acetate; and (c) **2 - 40** mole % acrylic acid, methacrylic acid, or an alkali metal salt thereof; said polymer having a number average molecular weight of at least 500 and being soluble in water at least to the extent of 30% by weight at 25°C.

3,887,481

BENZOTRIAZOLE AND TOLYLTRIAZOLE MIXTURE WITH TETRACHLOROETHYLENE

Charles J. Korpics, Toledo, Ohio, assignor to The Sherwin-Williams Company, Cleveland, Ohio

Continuation of Ser. No. 152,528, June 14, 1971, Pat. No. 3,803,049. This application Mar. 9, 1973, Ser. No. 339,527

Int. Cl. C11d 7/50; C23f 11/14; C23g 5/02

U.S. Cl. 252—172 1 Claim

1. A solution of a triazole in tetrachloroethylene, consisting of a mixture of from 2 to 98 percent of benzotriazole and from 98 to 2 percent of tolyltriazole, where the total amount of triazole dissolved is a function of the proportion of benzotriazole and tolyltriazole present in the solution, and is represented by the shaded area between curve A and B of FIG. 6 of the attached drawing.

3,887,482

COMPOSITIONS FOR FLORIDATING DRINKING WATER

Carl-Johan Sigvard Hellestam; Karl-Axel Melkersson, both of Helsingborg, and Rolf Olof Nilsson, Viken, all of Sweden, assignors to Boliden Aktiebolag, Sweden

Continuation of Ser. No. 203,062, Nov. 29, 1971, abandoned. This application Oct. 9, 1973, Ser. No. 404,146

Claims priority, application Sweden, Nov. 30, 1970, 16214/70

Int. Cl. C02b 1/18, 9/00

U.S. Cl. 252—175 11 Claims

1. A composition for use in adding fluorine to drinking water for the purpose of reducing dental caries when using said water, such addition of fluorine being carried out in connection with purification of crude water to form drinking water by flocculation with aluminium sulphate, sedimentation and filtration, comprising crystallized aluminium sulphate and homogeneously distributed therethrough, a fluorine compound selected from the group consisting of NaF, H_2SiF_6, Na_2SiF_6, $(NH_4)_2SiF_6$ and Na_3AlF_6 in an amount corresponding to 0.5 – 5 percent by weight of fluorine based on the weight of the composition.

3,887,483

PRECURSOR COMPOSITIONS FOR COLD CURE HIGH RESILIENCE FOAMS

Edward Lewis Morehouse, New City, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

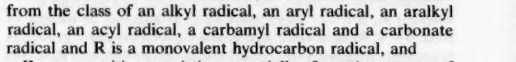
Division of Ser. No. 84,181, Oct. 26, 1970, Pat. No. 3,741,917. This application Apr. 17, 1973, Ser. No. 351,978

Int. Cl. C08g 22/46

U.S. Cl. 252—182 11 Claims

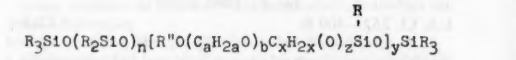
1. A composition suitable for use in producing a cold cure high resilience polyether urethane foam selected from the class consisting of

I. a composition consisting essentially of a major amount of an organic polyol selected from the group consisting of (A) a polyether triol containing at least 40 mole per cent primary hydroxyl groups and having a molecular weight from about 2,000 to about 8,000 and (B) a mixture of said polyether triol and another polyether having an average of at least two hydroxyl groups, said polyether triol of said mixture amounting to at least 40 weight per cent of the total polyol content, and a minor amount of a siloxane block copolymer having a molecular weight from about 500 to about 2,500, a siloxane content from about 40 to about 70 weight per cent based on the weight of the copolymer and an oxyethylene content of at least 35 per cent based on the total amount of any oxyalkylene groups present in said copolymer, said copolymer having the formula



wherein z has a value of 0 or 1, n has a value from 2 to 7 inclusive, y has a value from 1 to 6 inclusive, a has a value from 2 to 4 inclusive, x has a value from 2 to 4 inclusive, b has a value of from 0 to 10 inclusive, R'' is a member selected from the class of an alkyl radical, an aryl radical, an aralkyl radical, an acyl radical, a carbamyl radical and a carbonate radical and R is a monovalent hydrocarbon radical, and

II. a composition consisting essentially of a major amount of water, a minor amount of an amine catalyst, a minor amount of an organic surfactant, and a minor amount of a siloxane block copolymer having a molecular weight from about 500 to about 2,500, a siloxane content from about 40 to about 70 weight per cent based on the weight of the copolymer and an oxyethylene content of at least 35 weight per cent based on the total amount of any oxyalkylene groups present in said copolymer, said copolymer having the formula



wherein z has a value of 0 or 1, n has a value of from 2 to 7 inclusive, y has a value from 1 to 6 inclusive, a has a value from 2 to 4 inclusive, b has a value of from 0 to 10 inclusive, R'' is a member selected from the class of an alkyl radical, an aryl radical, an aralkyl radical, an acyl radical, a carbamyl radical and a carbonate radical and R is a monovalent hydrocarbon radical.

3,887,484

HALOALKYLATION AGENT OF AROMATIC HYDROCARBONS

Amos Norwood, Philadelphia, Pa., assignor to Sybron Corporation, Rochester, N.Y.

Filed Nov. 16, 1972, Ser. No. 307,021

Int. Cl. C09k 3/00

U.S. Cl. 252—188.3 R 8 Claims

1. A haloalkylating agent comprising the reaction product of a formaldehyde source, selected from a group consisting of formalin, paraformaldehyde, polyoxymethylene and methylal; a polar liquid selected from a group consisting of aldehydes, ketones, liquid organic acids, nitroparaffins and primary alcohols containing 1–4 carbon atoms; sulfuric acid and a halide source, selected from the group consisting of the tetrabromides and tetrachlorides of zirconium, titantium, hafnium and mixtures thereof.

3,887,485

SOLID OPTICAL FILTER HAVING SELECTIVE WAVELENGTH PERMEABILITY

Norbert Neuroth, Maniz-Mombach, Germany, assignor to Jenaer Glaswerk Schott & Gen., Germany

Continuation-in-part of Ser. No. 79,739, Oct. 12, 1970, abandoned. This application Sept. 1, 1972, Ser. No. 285,899

Claims priority, application Germany, Oct. 31, 1969, 1954802

Int. Cl. G02b 5/20; F21v 9/02, 9/06

U.S. Cl. 252—300 4 Claims

1. An optical filter comprising a compressed solid mass of light ray permeable embedding powder; and dispersed powder, said embedding powder having a refractive index in a short-wave spectral range smaller than that of the dispersed powder, said dispersed powder having a refraction index that

changes in relation to the wave length of the light more greatly than the refractive index of the embedding powder so that in a specific wave length range the refractive indices of embedding powder and the dispersed powder are equal, said embedding powder being solid and capable of withstanding operational temperatures of the filter as high as between about 400° to 600°C, in which said embedding powder is selected from the group consisting of LiF, CaF_2, LaF_2, NaF, and BaF_2 and in which said dispersed powder consists of material selected from the group consisting of quartz glass, $NHCO_3$, boro silicate glass, boro silicate glass containing BaO and La_2O_3, quartz crystal, phosphate fluoride glass, GeO_2 powder, $baTio_3$, magnesium-aluminum-silicoborate glass, and barium borosilicate glass.

3,887,486
POROUS, MICROSPHEROIDAL, NUCLEAR FUELS HAVING INTERNAL POROSITY

John M. Googin, and Charles R. Schmitt, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Division of Ser. No. 48,579, May 25, 1970, abandoned. This application Oct. 16, 1972, Ser. No. 298,134

Int. Cl. G21c *3/02*

U.S. Cl. 252—301.1 R **13 Claims**

1. A microspheroidal particle consisting essentially of a porous matrix of carbon or graphite, a substantial portion of the porosity of said matrix being of the closed-pore type, and an oxide or carbide of a metal selected from the group uranium, plutonium, and thorium within the internal volume and closed pores of said matrix.

6. Microspheres of uranium carbide produced by loading an ion exchange resin containing ion exchange sites for sorbing uranyl ions, drying the loaded resin and then heating said dried resin in an inert atmosphere at a temperature in the range 1,400°–2,200°C. to convert the resin to a porous carbon matrix containing closed pores and a homogeneously dispersed uranium carbide phase.

12. A microspheroidal particle 5 to 2,000 microns in diameter consisting essentially of a porous carbon matrix and a compound selected from the group consisting of an oxide and a carbide of at least one metal selected from the group consisting of uranium, plutonium, and thorium distributed within said matrix.

3,887,487
PROCESS FOR REMOVING BUBBLES OF GAS FROM LIQUIDS

Michel Camp, Lyon, and Paul Rostaing, Vienne, both of France, assignors to Rhone-Poulenc, S.A., Paris, France

Filed Jan. 31, 1973, Ser. No. 328,237

Claims priority, application France, Feb. 2, 1972, 72.03486

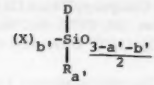
Int. Cl. B01d *19/04*

U.S. Cl. 252—321 **7 Claims**

1. A process for treating a liquid which is a hydraulic fluid, a heating fluid, a lubricating oil or a printing ink, to remove bubbles of gas dispersed therein or to inhibit formation of the dispersion of gas therein which comprises incorporating into the liquid in an amount of 0.0001% to 0.25% of the weight of the liquid an organosilicon compound containing at least one oxirane ring, which is bonded directly to a silicon atom or forms part of an organic radical bonded to a silicon atom by a Si-C bond, and selected from the group consisting of:

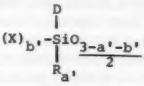
a. silanes of the general formula $(X)_{3-a}R_aSiD$ in which the symbol X represents a hydrolysable group, the symbol R a monovalent hydrocarbon group or a monovalent halogeno-hydrocarbon group, the symbol D an oxirane radical bonded directly to the silicon atom or a monovalent organic radical containing an oxirane ring and bonded to the silicon atom by a Si—C bond, and the symbol *a* represents 0, 1, 2 or 3,

b. organopolysiloxane homopolymers consisting of units of the formula:



in which the symbols X, D and R are as defined above and each of *a'* and *b'*, which may be the same or different, represents zero, 1 or 2, the sum $a' + b'$ being 0, 1 or 2, and

c. organopolysiloxane copolymers consisting of units of the formula



and

$$R_xSiO_{(4-x)/2}$$

the symbols X, D, R, *a'* and *b'* being as defined above and the symbol x representing 0, 1, 2 or 3.

3,887,488
INHIBITION OF CORROSION IN SULFURIC ACID SOLUTIONS

Robert H. Scott, Corpus Christi, and Dan L. Gaulding, Driscoll, both of Tex., assignors to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 232,939, March 8, 1972, abandoned, which is a continuation-in-part of Ser. No. 825,070, May 15, 1969, abandoned. This application June 26, 1974, Ser. No. 483,167

Int. Cl. C23f *11/04*; **C23g** *1/04, 1/06*

U.S. Cl. 252—389 A **12 Claims**

1. A method for inhibiting the corrosivity of aqueous sulfuric acid solutions towards metals, said method comprising incorporating into an aqueous sulfuric acid solution, which has a pH of between 0.01 to about 3.0, an amount ranging from 1 to 10,000 ppm of a corrosion inhibitor consisting essentially of a phosphorus compound having at least one phosphorus atom linked to an unshared oxygen atom and selected from the group consisting of oxy acids of phosphorus, salts of the oxy acids of phosphorus, esters of the oxy acids of phosphorus and oxides of phosphorus.

2. A method for inhibiting the corrosivity of aqueous sulfuric acid solutions toward metals, said method comprising incorporating into an aqueous sulfuric acid solution, which has a pH of between about 0.5 and 3.0, an amount ranging from 1 to 10,000 ppm of a corrosion inhibitor consisting essentially of a phosphorus compound having at least one phosphorus atom linked to an unshared oxygen atom and selected from the group consisting of oxy acids of phosphorus, salts of the oxy acids of phosphorus, esters of the oxy acids of phosphorus and oxides of phosphorus.

10. An aqueous sulfuric acid solution with a pH of between about 0.5 and 3.0 having incorporated therein a corrosion inhibitor consisting of orthophosphoric acid in a concentration of about 1 to 10,000 ppm.

3,887,489

RHODIUM CATALYST REGENERATION METHOD

Loyd W. Fannin, Dickinson, Tex.; Victor D. Phillips, Jr., Ballwin, Mo., and Thomas C. Singleton, Texas City, Tex., assignors to Monsanto Company, Texas City, Tex.

Filed Nov. 24, 1972, Ser. No. 309,560
Int. Cl. B01j *11/80*; C07c *31/14*; C08h *17/36*
U.S. Cl. 252—413 6 Claims

1. A process for the regeneration of a spent catalyst solution containing a soluble rhodium iodocarbonyl complex, hydrogen iodide, water, acetic acid and metallic corrosion products which comprises heating said spent catalyst solution with agitation at a temperature from about 100° to 190°C at a pressure sufficient to boil the solution for a period of time necessary to obtain a rhodium-containing precipitate from said solution and reduce the rhodium content of said solution to a predetermined level, separating the solid rhodium-containing precipitate from said liquid solution, adding a quantity of a solvent selected from the group consisting of water, acetic acid and mixtures thereof and an iodine-containing component selected from the group consisting of iodine, hydrogen iodide, alkyl iodides, aryl iodides and iodine salts to said rhodium-containing precipitate and heating the resulting mixture in contact with carbon monoxide while maintaining constant agitation until solution is effected.

3. The process of claim 1 wherein heating of said spent catalyst solution is effected at a temperature of at least 140° C and in the presence of an alkyl alcohol in which the alkyl group contains 1 to 5 carbon atoms, the amount of said alcohol being sufficient to provide a mole ratio of alcohol to hydrogen iodide in the spent catalyst solution of at least 1:1.

3,887,490

PROCESS FOR REGENERATING NOBLE METAL CATALYST FOR THE SYNTHESIS OF HYDROGEN PEROXIDE ACCORDING TO THE ANTHRAQUINONE PROCESS

Gerd Schreyer; Ferdinand Theissen, both of Grossauheim; Otto Weiberg, Neuisenburg, and Wolfgang Weigert, Offenbach, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Continuation of Ser. No. 174,234, Aug. 23, 1971, abandoned. This application Aug. 20, 1973, Ser. No. 389,543
Claims priority, application Germany, Aug. 27, 1970, 2042523
Int. Cl. B01j *11/18*; C01b *15/02*
U.S. Cl. 252—414 7 Claims

1. A process for the in situ regeneration of noble metal catalyst of the platinum group of the periodic system for the synthesis of hydrogen peroxide by the anthraquinone process, said catalyst being deposited on a catalyst consisting of silica, said process comprising introducing into the hydrogenation step of the anthraquinone process an anthraquinone working solution still containing 300 mg/liter up to 1,000 mg/liter of hydrogen peroxide to thereby completely regenerate the noble metal catalyst to full hydrogenation capacity.

6. A process according to claim 1 wherein the working solution introduced into the hydrogenation step to regenerate the catalyst directly in the hydrogenation step and the hydrogenated working solution is returned to the oxidation step to form further hydrogen peroxide, the thus formed oxidized working solution is extracted or desorbed to reduce the H_2O_2 content to 300—1,000 mg/liter and is then again reintroduced into the hydrogenation step.

3,887,491

METHOD OF PREPARING SILVER CATALYST

Enrique Garcia Ramirez, Bay City; Lowell Curtis Thomas, Lake Jackson, and William Earl Fry, Angleton, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 5, 1973, Ser. No. 413,002
Int. Cl. B01j *11/20*
U.S. Cl. 252—430 4 Claims

1. In a process for making a supported silver catalyst in which a soluble silver compound is impregnated onto a support from an aqueous solution thereof, subsequently dried and reduced to metallic silver, the improvement of adding to said aqueous solution a natural gum selected from the group consisting of karaya, ghatti, tragacanth, guar, saponin, locust bean, psyllium seed, quince seed, agar, algin, carrageenan, furcellaran, pectin, gelatin and casein in an amount of from about 0.5 to about 2.5 percent based on the total weight of said aqueous solution.

3,887,492

PREPARATION OF AMORPHOUS ALUMINA SPHERES

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed July 16, 1973, Ser. No. 379,680. The portion of the term of this patent subsequent to Apr. 7, 1992, has been disclaimed.
Int. Cl. B01j *11/44*
U.S. Cl. 252—448 8 Claims

1. A method of preparing amorphous, high surface area alumina spheres, which comprises:

a. commingling an ammonia precursor and an acidic alumina hydrosol at below gelation temperature, said ammonia precursor being decomposable to ammonia with increasing temperature;
b. dispersing the mixture as droplets in a hot oil bath effecting decomposition of said ammonia precursor and formation of hydrogel spheres therein;
c. separating and immersing the hydrogel particles in an aqueous ammonium chloride salt solution having a pH of at least about 5.5, and having a salt concentration substantially equivalent to the salt concentration of the internal aqueous phase of said hydrogel particles;
d. maintaining said particles in contact with said solution while reducing the salt concentration gradually at conditions to minimize the concentration gradient between said solution and the internal aqueous phase of said particles, until said solution is substantially salt-free;
e. separating, and drying and calcining the resulting salt-free hydrogel particles.

3,887,493

METHOD OF PREPARING SPHEROIDAL ETA-ALUMINA PARTICLES

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed July 16, 1973, Ser. No. 379,678
Int. Cl. B01j *11/44*
U.S. Cl. 252—448 7 Claims

1. A method of preparing spheroidal alumina particles which comprises:

a. commingling an ammonia precursor and an acidic alumina hydrosol at below gelation temperature, said ammonia precursor being decomposable to ammonia with increasing temperature;
b. dispersing the mixture as droplets in a hot oil bath effecting decomposition of said ammonia precursor and formation of hydrogel spheres therein;
c. immersing the hydrogel spheres in an aqueous ammonium chloride salt solution at a temperature of from about 25° to about 60° C., and at a pH of at least about 5.5, said aqueous salt solution having a salt concentration substantially equivalent to the salt concentration of the internal aqueous phase of said hydrogel spheres;

d. maintaining said hydrogel spheres in contact with said solution at said temperature while gradually reducing the salt concentration at conditions to minimize the concentration gradient between said solution and the internal aqueous phase of said hydrogel particles until said solution is substantially salt-free, and adjusting the pH of said solution to at least about 9;

e. aging the spheres at said pH of at least about 9 and forming crystalline bayerite alumina spheres.

3,887,494

OLEFIN POLYMERIZATION CATALYST

Richard E. Dietz, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 89,047, Nov. 12, 1970. This application May 24, 1973, Ser. No. 363,483

Int. Cl. B01j *11/32, 11/06*

U.S. Cl. 252—452 **12 Claims**

1. A method of preparing a silica-containing composition catalytically active for olefin polymerization comprising:

a. adding a titanium compound to a mineral acid;

b. introducing an alkali metal silicate into the acid containing said titanium compound to form a hydrogel;

c. aging the hydrogel for a time of greater than one hour;

d. washing the thus aged hydrogel to produce a substantially alkali metal-free hydrogel;

e. forming a mixture comprising the thus washed hydrogel and a normally liquid oxygen-containing, water soluble organic compound;

f. separating said organic compound and water from said mixture to form a xerogel; and,

g. heating said xerogel also containing chromium at a temperature of 900° to 1800° F to produce a composition catalytically active for olefin polymerization.

3,887,495

CATALYST PARTICULARLY USEFUL FOR DEHYDROGENATING SATURATED HYDROCARBONS

Bernard Juguin, and Jean-Francois Le Page, both of Rueil-Malmaison, France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil-Malmaison, France

Filed Nov. 7, 1972, Ser. No. 304,543

Claims priority, application France, Nov. 19, 1971, 71.41426

Int. Cl. B01f *11/06, 11/08*

U.S. Cl. 252—464 **20 Claims**

1. A catalyst consisting essentially of (a) alumina, (b) rhenium and (c) at least one metal from groups III A, IV A and V A of the periodic classification of the elements, selected from the group consisting of gallium, indium, thallium, germanium, tin, lead, antimony and bismuth, said catalyst having a specific surface of about 20 to 80 m^2/g and a neutralization heat by ammonia adsorption lower than about 10 calories per gram of catalyst at 320°C and under a pressure of 300 mm of mercury, the total content by weight of rhenium being from 0.01 to 1% and the total content by weight of metals from groups III A, IV A and V A being from 0.01 to 0.5%, said catalyst being essentially free of group VIII metals.

3,887,496

QUATERNARY AMMONIUM ELECTROCONDUCTIVE RESIN COATING COMPOSITIONS

Sally P. Cornier, Sanford; Ben A. Tefertiller, and Richard J. Dolinski, both of Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 2, 1972, Ser. No. 277,319

Int. Cl. H01b *1/00*

U.S. Cl. 252—500 **10 Claims**

1. An improved aqueous electroconductive resin coating composition containing as essential elements:

A. A water-soluble quaternary ammonium electroconductive resin, and

B. About 0.05–0.50 parts, based on the weight of the electroconductive resin, of a water-dispersible, substantially nonionic acrylamide polymer containing at least 20 wt. % polymerized acrylamide and having a 0.5 wt. % aqueous solution viscosity of less than about 5.0 cps at pH 5–6 and 25°C.

3,887,497

LIQUID CLEANSING COMPOSITION AND METHOD OF PRODUCING

George B. Ulvild, 1210 Dona Dr., Corpus Christi, Tex. 78407

Filed Mar. 15, 1973, Ser. No. 341,383

Int. Cl. C11d *3/065, 3/08*

U.S. Cl. 252—526 **22 Claims**

1. A one phase cleansing composition comprising (a) an anionic detergent surfactant which is an alkylamine salt or an alkylolamine salt of an alkylbenzene sulfonic acid, (b) a normally liquid organic solvent, (c) water and (d) an alkaline builder material or a builder material which is a mineral acid or a neutral or acidic inorganic salt thereof, wherein in said composition the molar ratio of said builder material to said detergent surfactant is within the range of 0.01:1 to 3:1, wherein the weight ratio of said solvent to said detergent surfactant is within the range of 1:1 to 5:1, wherein said water is present in amounts of from about 4.0 to 80 weight per cent, and wherein the alkyl portion of said alkylbenzene sulfonic acid contains substantially from 11 to 13 carbon atoms.

3,887,498

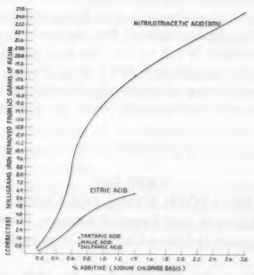
METHOD FOR REGENERATION OF CATION EXCHANGE RESINS AND FOR REMOVAL OF IRON DEPOSITS THEREFROM

Eugene J. Kuhajek, Crystal Lake; Howard W. Fiedelman, and Gordon H. Tibbitts, both of Woodstock, all of Ill., assignors to Morton-Norwich Products, Inc., Chicago, Ill.

Filed Mar. 12, 1973, Ser. No. 339,611

Int. Cl. B01d *15/06*

U.S. Cl. 260—2.2 R **4 Claims**

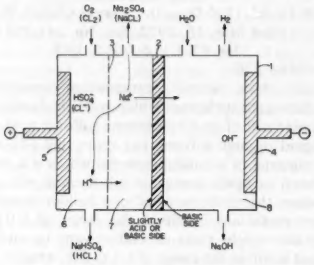


1. A method of regenerating a cation exchange resin which has been used for softening hard water and which has become iron-fouled and substantially exhausted by reason thereof, which method comprises contacting said resin with an aqueous solution containing about 10% by weight of sodium chloride and based on said sodium chloride at least about 0.175% by weight of nitrilotriacetic acid, the pH of said aqueous solution containing said sodium chloride and said nitrilotriacetic acid being less than about 3 pH units.

3,887,499
CATION EXCHANGE MEMBRANES HAVING CARBOXYLIC AND SULFONIC ACID FUNCTIONALITY

Russell B. Hodgdon, Jr., Sudbury, Mass., assignor to Ionics, Incorporated, Watertown, Mass.

Continuation of Ser. No. 205,056, Dec. 6, 1971, abandoned. This application Aug. 23, 1973, Ser. No. 394,212
Int. Cl. C08f 19/20
U.S. Cl. 260—2.2 R 1 Claim



1. A solid bifunctional cation selective membrane having at least two dimensions in excess of one cm. comprising a cross-linked polymer matrix bonded to both carboxylic acid and sulfonic acid functional groups, said matrix being a polymerized product of a solution mixture of at least one monvinyl aromatic monomer, at least one polyvinyl aromatic monomer, at least one olefinic carboxylic monomer and a non-polymerizable organic hydrocarbon solvent, said mixture containing said polyvinyl monomer between 40–50 mole % of the total polymerizable monomers and between 20–50% by volume of said non-polymerizable solvent, the said sulfonic acid groups being chemically bonded to the vinyl aromatic nuclei of said polymer matrix in an amount averaging 0.65 to 1.2 groups for every carboxylic acid group containing therein and wherein the mole ratio of the monovinyl monomer to carboxylic monomer is 1:3 to 3:1, the said membrane having a capacity of between about 4 to 11 meg./dry gm. of polymerized product, and being substantially dimensionally stable and ionically conductive substantially over the entire pH range.

3,887,500
ORGANOSILICONE POLYMERS

Bela Prokai, Mahopac, and Bernard Kanner, West Nyack, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 279,882, Aug. 11, 1972, Pat. No. 3,846,403. This application Nov. 29, 1973, Ser. No. 420,233
Int. Cl. C08g 22/44
U.S. Cl. 260—2.5 AH 9 Claims

1. A process for producing flexible polyurethane foam which comprises reacting and foaming a reaction mixture comprising:

a. a polyether polyol reactant containing an average of at least two hydroxyl groups per molecule,
b. a polyisocyanate reactant containing at least two isocyanato groups per molecule,
c. a blowing agent,
d. a catalyst comprising an amine, and
e. a foam stabilizer comprising a polysiloxanepolyoxyalkylene block copolymer having the average composition,

$$R_3SiO[R_2SiO]_x[RSiO]_y[RSiO]_zSiR_3$$
$$R'CN \quad R''_p(OC_2H_4)_n(OC_3H_6)_mOW$$

where

R is an alkyl group having from 1 to 10 carbon atoms,
R' has from 2 to 12 carbon atoms and is a bivalent alkylene or a bivalent oxyalkylene group the oxygen atom of which is bonded to silicon,
R'' is an organic radical comprising a bivalent alkylene group a carbon atom of which is bonded to silicon,
W comprises a monovalent hydrocarbyl group having from 1 to 12 carbon atoms,
p has a value of zero or one,
x has an average value from about 10 to about 200,
y has an average value from 3 to about 100,
z has an average value from about 2 to about 30,
and the average values of m and n are such that the average molecular weight of the chain, $-(C_3H_6O)_m(C_2H_4O)_n-$, is from about 1000 to about 6000 and from about 20 to about 65 weight percent of the chain is constituted of oxyethylene units;

said reaction mixture containing from 0.8 to 1.5 equivalents of —NCO per equivalent of total active hydrogen contained in said mixture, and from about 0.1 to about 5 parts by weight of said block copolymer per one hundred parts by weight of said polyether polyol reactant (a).

3,887,501
PROCESS FOR THE PREPARATION OF CARBODIIMIDE-ISOCYANURATE FOAMS

Thirumurti L. Narayan, Riverview, and Moses Cenker, Trenton, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 21, 1973, Ser. No. 427,122
Int. Cl. C08g 22/44, 33/04
U.S. Cl. 260—2.5 BF 8 Claims

1. A process for the preparation of a cellular foam characterized by carbodiimide and isocyanurate linkages which comprises condensing an organic polyisocyanate in the presence of a catalytically sufficient amount of a catalyst system consisting essentially of methanol and a tertiary amine trimerization catalyst selected from the group consisting of 1,3,5-tris(N,N-dialkylaminoalkyl)-s- hexahydrotriazines, the alkylene oxide and water adducts thereof, and 2,4,6-tris(dimethylaminomethyl)phenol.

3,887,502
PREPARATION OF RIGID POLYURETHANE FOAM HAVING IMPROVED AGING PROPERTIES

Pierrepont Adams, Darien, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 252,613, May 12, 1972, Pat. No. 3,799,963. This application Jan. 16, 1974, Ser. No. 433,969. The portion of the term of this patent subsequent to Mar. 26, 1991, has been disclaimed.
Int. Cl. C08g 22/44, 22/26
U.S. Cl. 260—2.5 AT 13 Claims

1. In a process for preparing a rigid polyurethane foam from a reaction mixture comprised of a polyol, a foaming agent, a reaction catalyst and a crude product of the phosgenation of toluene diamine, the improvement which comprises heating said crude product, before it is used in making said foam, to a temperature of about 120°–250°C in the presence of about 0.05–8 percent by weight, based on the weight of said crude product, of formic acid.

3,887,503

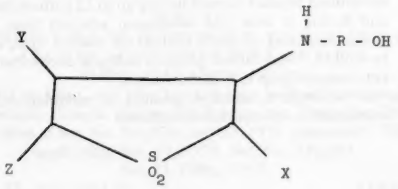
3-(HYDROXYHYDROCARBYLSECONDARYAMINO)THIOPHENE 1,1-DIOXIDES AND POLYURETHANES CHAIN EXTENDED THEREWITH

Chung-Ling Mao, Sandy Hook, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Jan. 18, 1974, Ser. No. 434,470
Int. Cl. C08g *22/02, 22/16, 22/44*
U.S. Cl. 260—2.5 AM **35 Claims**

1. In a method of making polyurethanes which comprises reacting a long chain polyol selected from the group consisting of polyesters, polyethers and polyhydrocarbons with a chain extender and with a polyisocyanate, the improvement which comprises using as chain extender a 3-(hydroxyhydrocarbylsecondaryamino)thiophene 1,1-dioxide of one of the following formulas I or II:

Formula I:



wherein

X may be hydrogen, an alkyl group having 1 to 5 carbon atoms or a halogen atom,

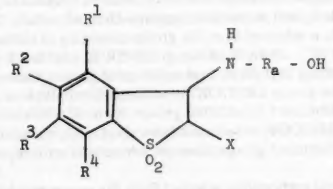
Y may be hydrogen, an alkyl group having 1 to 5 carbon atoms, or a phenyl group,

Z may be hydrogen, an alkyl group having 1 to 5 carbon atoms a phenyl group, or a halogen atom,

R may be (1) an open chain alkylene group having 2 to 10 carbon atoms, (2) an open chain alkylene group having 2 to 10 carbon atoms in the alkylene portion substituted with one or more phenyl groups, or (3) a cycloalkylene group having 4 to 8 carbon atoms,

the hydroxyl group being attached to a carbon atom of R that is separated from the secondary amino nitrogen by at least one carbon atom;

Formula II:



wherein

X may be as defined in Formula I,

R_a may be (1) an open chain alkyene group having 2 to 10 carbon atoms, (2) an open chain alkylene group having 2 to 10 carbon atoms in the alkylene portion substituted with at least one or more phenyl groups, and (3) a cycloalkylene group having 4 to 8 carbon atoms,

the hydroxyl group being attached to a carbon atom of R_a that is separated from the secondary amino nitrogen atom by at least one carbon atom, and

R^1, R^2, R^3 and R^4 are the same or different and are hydrogen, an alkyl group having 1 to 5 carbon atoms, or halogen.

2. A method as in claim **1** in which water is added as an additional reactant, and the resulting polyurethane is a foam.

3,887,504

PROCESS OF MAKING A SULFUR CONTAINING FOAM AND PRODUCT OBTAINED THEREFROM

Gar Lok Woo, Tiburon, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 344,694, March 26, 1973, which is a continuation-in-part of Ser. No. 253,144, May 15, 1972, abandoned. This application Jan. 31, 1974, Ser. No. 438,508
Int. Cl. C08g *22/44*
U.S. Cl. 260—2.5 AM **33 Claims**

1. A process for producing sulfur foam containing at least 50 weight percent sulfur, which comprises contacting and reacting molten sulfur with .001 to 1.0 g. mole acid equivalents of an organic protonic acid per 100 grams of sulfur wherein the organic protonic acid is reactive with molten sulfur so as to incorporate the organic acid with sulfur to form a sulfur-organic acid adduct containing protonic acid groups, and then contacting and reacting the protonic acid groups of the adduct with an organic polyisocyanate to obtain sulfur foam and wherein said contacting and reacting are carried out in the liquid phase.

3,887,505

PREPARATION OF LOW DENSITY FLEXIBLE URETHANE FOAMS WITH ENHANCED LOAD-BEARING PROPERTIES

John G. Demou, Lincoln Park, and Moses Cenker, Trenton, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 3, 1973, Ser. No. 421,088
Int. Cl. C08g *22/40, 22/46, 22/14*
U.S. Cl. 260—2.5 AB **7 Claims**

1. In the preparation of low-density flexible polyurethane foams having improved load-bearing properties by a process which comprises reacting:

a. a polyoxyalkylene ether polyol or polyol blend which was prepared by condensing monomeric units such as ethylene oxide, propylene oxide, butylene oxide and mixtures thereof with active hydrogen compounds selected from the group consisting of 1,2-propylene glycol, 1,3-propylene glycol, 1,2-butanediol, 1,4-butanediol, 1,3-butanediol, hexanetriol, glycerol, trimethylolpropane, hydroquinone, pentaerythritol, alpha-methyl glucoside, sorbitol, and sucrose, having an equivalent weight of at least 100 and a primary hydroxyl content of at least 17 percent,

b. an organic polyisocyanate,

c. water, and **1** – polyoxyalkylene

d. a surfactant,

the improvement comprising catalyzing the reaction in the presence of an organic stannous compound selected from the group consisting of stannous acetate, stannous butyrate, stannous laurate, stannous octoate, stannous stearate, stannous oleate and stannous linoleate, as the sole catalyst.

3,887,506
PROCESS OF STABILIZING SOIL AND SOIL ADDITIVE PRODUCT

Robert L. Hewitt, Atlanta, Ga., assignor to Terra Perma, Inc., Atlanta, Ga.

Filed Oct. 11, 1973, Ser. No. 405,484
Int. Cl. C08f 45/52
U.S. Cl. 260—17 A 1 Claim

1. An additive for stabilizing in situ water permeable soil comprising from 80 – 90% by weight of a composition comprising vinyl acetate homopolymer, hydroxethyl cellulose, a non-ionic ethoxylated surfactant, potassium persulfate, sodium bicarbonate and water; from 5 – 10% by weight of a polyvinyl alcohol mixture comprising water, hydrogen peroxide, glycerin and polyvinyl alcohol; and from 5 – 10% by weight of a water repellent emulsion comprising wax, an ethoxylated surfactant, diglycol stearate, stearic acid, zirconium acetate, ethylene urea resin and water.

3,887,507
PROCESS FOR PREPARING TRIKETOIMIDAZOLIDINES AND PRODUCT

Johannes Reese, Wiesbaden-Biebrich, and Kurt Kraft, Auringen, both of Germany, assignors to Reichhold-Albert-Chemie-Aktiengesellschaft, Hamburg, Germany

Continuation-in-part of Ser. No. 154,634, June 18, 1971. This application Jan. 18, 1972, Ser. No. 218,691
Claims priority, application Germany, Aug. 4, 1971, 2139005
Int. Cl. C08g 33/02, 33/10
U.S. Cl. 260—37 N 17 Claims

1. A process for the manufacture of modified N,N′-substituted 2,4,5-triketoimidazolidines which comprises reacting

(a) at least one oxamidic ester of Formula VII

$$R-(NH-CO-CO-OR^{V})_r \qquad (VII)$$

wherein:

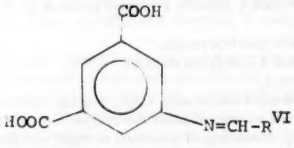
R is a mono- or polynuclear, mono to hexavalent carbocyclic or heterocyclic aromatic including quinone group and having up to 20 carbon atoms being unsubstituted or substituted by at least one substituent having up to 18 carbon atoms selected from the group consisting of halogen, nitro, dialkylamino, diarylamino, alkylarylamino and halogenated or unhalogenated alkyl, alkoxy, carboxyalkyl, carboxyaryl and acyl groups,

r is an integer of from 1 to 6, and wherein

R^{V} is individually selected from the group consisting of an aliphatic hydrocarbon group having up to 18 carbon atoms, a cycloaliphatic hydrocarbon group with up to 8 carbon atoms, a mononuclear aromatic hydrocarbon group being unsubstituted or substituted by at least one hydrocarbon group and having a total of up to 14 carbon atoms

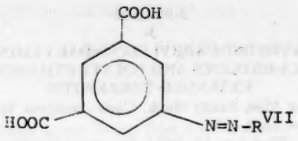
(b) at least one organic isocyanate, and (D) at least one compound selected from the group consisting of

(d) an azomethine of Formula (37)



(e) a metal chelate of component (d),

(f) an azo compound of Formula (38),



(g) a metal chelate of component (f),

wherein

R^{VI} is an aromatic group having at least one aromatic nucleus and having from 6 to 14 carbon atoms and containing a hydroxy group ortho to the azomethine group, a substituted product thereof having from 6 to 22 carbon atoms and having at least one substituent selected from the group consisting of alkyl, cycloalkyl, benzyl, hydroxy, methoxy, aryl, aryloxy, carboxyl, acyl, nitro, and halogen, each substituent containing up to 6 carbon atoms,

R^{VII} is an aromatic group having 6 to 14 carbon atoms and containing a hydroxy group ortho to the azo group, a substituted product thereof having up to 22 carbon atoms and having at least one substituent selected from the group consisting of alkyl, cyclohexyl, alkoxy, acyl, carboxyalkyl, a fluorcarbon group or halogen, each substituent containing up to 6 carbon atoms

so as to obtain a reaction product of modified N,N′-substituted 2,4,5-triketoimidazalidine.

3,887,508
VINYL HALIDE STABILIZER COMPOSITIONS OF ANTIMONY ORGANIC SULFUR-CONTAINING COMPOUNDS AND METAL CARBOXYLATES

Dale J. Dieckmann, Euclid, Ohio, assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Nov. 20, 1973, Ser. No. 417,634
Int. Cl. C08f 45/62
U.S. Cl. 260—23 XA 16 Claims

1. A vinyl halide resin heat stabilizer composition which consists essentially of,

an antimony organic sulfur-containing compound having the formula

$$R_nSbX_{3-n}$$

where R of the formula is selected from the group consisting of alkyl, alkenyl, alkynyl, aryl, cycloalkyl, cycloalkenyl, mixed aryl-alkyl, and substituted groups thereof, where X of the formula is selected from the group consisting of sulfur, SR and SRCOOR′, where R of the group SR is selected from alkyl, aryl, mixed aryl-alkyl, and substituted groups thereof, where R of the group SRCOOR′ is selected from alkylene, arylene, aralkylene, and substituted groups thereof, wherein R′ of the group SRCOOR′ is selected from alkyl, aryl, mixed aryl-alkyl, and substituted groups thereof, where n is an integer of 0 to 2, and

a metal carboxylate selected from the group consisting of an alkali or alkaline earth metal salt of a carboxylic or thiocarboxylic acid, and mixtures thereof, said antimony compound and metal carboxylate components in relative amounts which together provide a synergistic heat stabilizing effectiveness upon said resin.

3,887,509

AMMONIUM SALTS OF RESINOUS POLYCARBOXYLIC ACIDS

Richard Bolstad, Bronx, N.Y., and Anna F. Melchoni, West Paterson, N.J., assignors to Inmont Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 409,482, Oct. 25, 1973, abandoned. This application Jan. 28, 1974, Ser. No. 437,356

Int. Cl. C08f *45/26*

U.S. Cl. 260—29.1 R **10 Claims**

1. A method of preparing ammonium salts of resinous polycarboxylic acids which comprises reacting the said polycarboxylic acid, in particulate form, with nascent ammonium generated in situ from particles of an ammonium coumpound of the group consisting of ammonium carbonate and ammonium bicarbonate, said reaction being carried out under substantially anhydrous conditions in an inert organic liquid between said particles of polycarboxylic acid and said particles of ammonium compound of such size that at least 95% by weight pass through a 60 mesh screen.

3,887,510

PROCESS FOR LOW TEMPERATURE PREPARATION OF AQUEOUS SOLUTION OF POLYALKYLENE AMINE-POLYAMIDE RESINS

Lock-Lim Chan, and John Edward Amy, both of Scarborough, Ontario, Canada, assignors to Borden, Inc., Columbus, Ohio

Division of Ser. No. 164,826, July 21, 1971, abandoned. This application Jan. 24, 1973, Ser. No. 326,503

Int. Cl. C08g *20/38*

U.S. Cl. 260—29.2 N **3 Claims**

1. In a process of preparing an aqueous solution of cationic thermosetting resin by (a) forming a long-chain water-soluble polyamide from a diester of a C_3 to C_6 saturated aliphatic dicarboxylic acid with a C_1 to C_3 saturated aliphatic alcohol and a polyalkylene polyamine having two primary amine groups and at least one secondary amine group the mol ratio of said polyamine to said diester being from about 0.8/1 to 1.4/1, and (b) then reacting said polyamide in aqueous solution with epichlorohydrin in amount such that the mol ratio of epichlorohydrin to the sum of secondary and tertiary amine groups in the polyamide is from about 0.5/1 to about 1.8/1, the improvement which comprises forming the polyamide by reacting the polyalkylene polyamine under substantially anhydrous conditions at from about 80° to about 95°C., from about 1.5 to 3 hours, at atmospheric pressure with the diester and removing the alcohol formed at a temperature no higher than about 105°C. to produce a polyamide having an intrinsic viscosity of from about 0.08 to 0.12 dl/gram in 1 n aqueous ammonium chloride at 25°C.

3,887,511

UREA-HCHO-DICYNDIAMIDE-OXY ACID OF PHOSPHORUS FIRE-RETARDANT FORMULATION AND PRODUCTS

Subhash C. Juneja, Ottawa, Ontario, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Nov. 30, 1972, Ser. No. 310,958

Claims priority, application Canada, Feb. 2, 1972, 133797

Int. Cl. C08g *37/28, 51/24, 9/14*

U.S. Cl. 260—29.4 R **12 Claims**

1. An aqueous liquid composition comprising an intermediate-stage resin solution formed by reacting:

a. a urea

b. dicyandiamide

c. formaldehyde and

d. oxy-acid of phosphorus;

in the following relative amounts:

a. about 1–10 moles

b. about 1–11 moles

c. about 1.2–3 moles per mole of (a) plus (b) and

d. about 0.5–2 moles per mole of (a) plus (b);

which reaction comprises dissolving (a) and (b) in an aqueous solution of (c) having a pH of about 7.5 to 9 and temperature of about 60° to 90°C, cooling to below about 50°C, and slowly adding (d), the solution having present excess or unreacted formaldehyde, acid in amounts sufficient to give an initial pH not significantly above about 3 and having a pot-life of at least about 1 month.

3,887,512

PLASTICIZED VINYL CHLORIDE POLYMERS

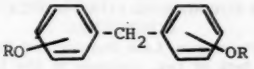
David A. Nelson, Littleton, Colo., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 7, 1974, Ser. No. 449,145

Int. Cl. C08f *45/34*

U.S. Cl. 260—33.2 R **5 Claims**

1. A plasticized vinyl chloride polymer containing a major proportion of polymerized vinyl chloride and as a plasticizing agent therefore from between about 40 to about 60 parts per hundred parts of polymer of a compound of the formula:



wherein R is selected from the group consisting of phenyl and alkyl containing from 1 to 4 carbon atoms.

3,887,513

NON-AQUEOUS PRINTING INK

Helmut Fritze, Wiesbaden; Kurt Hultzsch, Wiesbaden-Biebrich, and Hans-Jürgen Tietz, Langenhain, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Mar. 26, 1973, Ser. No. 345,117

Claims priority, application Germany, Mar. 29, 1972, 2215234; Mar. 29, 1972, 2215267

Int. Cl. C08f *45/28*

U.S. Cl. 260—33.6 UA **15 Claims**

1. A non-aqueous ink comprising a binder, at least one pigment and a non-aqueous volatile solvent in which the binding agent contains as an essential ingredient a compound selected from the group consisting of

a. a salt of a polymerization resin having units of carboxylic groups comprising a1) olefinically unsaturated monomers occurring in petroleum fractions boiling within the range from −20° to +280°C and a2) olefinically unsaturated at least monocarboxylic acid units having 3 to 8 carbon atoms, in a molar ratio of a1) : a2) = (2 to 20): 1, said salt having an average molecular weight in the range of 500 to 5000 and a saponification number in the range from 10 to 370 and

b. a combination of such salt with a reaction product of colophony with at most dibasic olefinically unsaturated carboxylic acids, 2 to 60% of the units of carboxylic groups of the polymerixation resin being bound to a cation of group I of the Periodic Table or an ammonium ion in which 0 to 4 hydrogen atoms are bound to the nitrogen atom or to a combination thereof and the units of carboxylic groups which are not present as a salt being free or at least in part esterified by an alcohol.

3,887,514
BODIED ORGANOPOLYSILOXANES AND PROCESS THEREFOR

Duane F. Merrill, Ballston Spa, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Jan. 2, 1974, Ser. No. 429,525
Int. Cl. C08g *51/28*
U.S. Cl. 260—33.6 SB **16 Claims**

1. A process for effecting the controlled condensation of silanol radicals in a silanol-containing organopolysiloxane, which comprises:

1. heating at a temperature between 200°C and 250°C a mixture comprising said silanol-containing organopolysiloxane, substantially free of any acidity in excess of about 5 parts per million by weight, and unactivated diatomaceous earth in an amount of from 0.75 to 20% by weight of said silanol-containing organopolysiloxane; and
2. recovering an organopolysiloxane from the resulting mixture of (1), having a viscosity higher than said silanol-containing organopolysiloxane which has an average ratio of from 1 to 1.8 organo radicals per silicon atom, selected from the group consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals.

3,887,515
PROCESS FOR MAKING LOW PROFILE MOLDING COMPOUNDS

Donald W. Pennington, Lake Jackson, and James H. Enos, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 329,703, Feb. 5, 1973, abandoned. This application Apr. 26, 1974, Ser. No. 464,378
Int. Cl. C08g *51/04*
U.S. Cl. 260—40 R **27 Claims**

1. An improved process for making low profile molding compounds from a mixture of a thermosettable resin and a copolymerizable monomer wherein said resin is an unsaturated polyester resin, a terminally unsaturated vinyl ester resin or mixtures thereof, said process comprises combining with 100 parts of said resin-monomer mixture at least about 0.1 part of a block copolymer viscosity reducing agent in combination with about 5 to 20 parts of a polymeric low profile additive, about 10 to 150 parts of $CaCO_3$ and up to 150 parts of a fibrous reinforcing material, wherein said block copolymer has the formula

$$B_x—CH_2CH_2(OCH_2CH_2)_yOH, \text{ or} \quad (I)$$

$$HO(CH_2CH_2O)_yCH_2CH_2—B_x—CH_2CH_2(OCH_2CH_2)_yOH \quad (II)$$

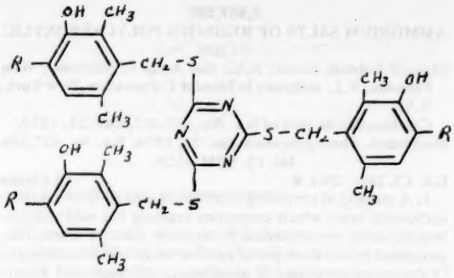
where B is a monoalkenyl aromatic monomer, a conjugated diene monomer or mixtures thereof polymerized into a block segment and where x and y, each, have a value of at least about 25.

3,887,516
HINDERED TRIS (META-HYDROXYBENZYLTHIO)-S-TRIAZINE ANTIOXIDANTS

John Song, Bound Brook, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 199,341, Nov. 16, 1971, Pat. No. 3,723,428. This application Oct. 20, 1972, Ser. No. 299,566
Int. Cl. C08f *45/58*
U.S. Cl. 260—45.8 N **5 Claims**

1. A composition comprising an organic material which tends to deteriorate upon exposure to oxygen containing, in an amount effective to inhibit oxidative degradation thereof, a compound of the formula:



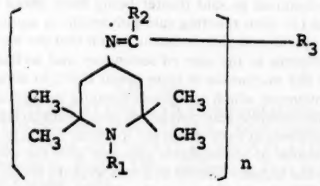
wherein R is a branched chain alkyl containing three to about 12 carbon atoms.

3,887,517
PIPERIDINE DERIVATIVES AND THEIR USE AS STABILIZERS

Keisuke Murayama; Katsuaki Matsui, and Tomoyuki Kurumada, all of Tokyo, Japan, assignors to Sankyo Co., Ltd., Japan

Filed Oct. 9, 1973, Ser. No. 404,147
Claims priority, application Japan, Oct. 25, 1972, 47-106796
Int. Cl. C08f *45/58*
U.S. Cl. 260—45.8 N **17 Claims**

1. A synthetic polymer composition stabilized against photo- and thermal-deterioration wherein there is incorporated, in a sufficient amount to prevent said deterioration, a compound having the formula



wherein R_1 represents hydrogen atom; and alkyl group having 1–4 carbon atoms which may be optionally substituted with hydroxy, alkoxy having 1–4 carbon atoms, phenoxy, aliphatic acyloxy having 2–18 carbon atoms, aromatic acyloxy having 7–11 carbon atoms, halogen, cyano, epoxy, alkoxycarbonyl having 1–4 carbon atoms in the alkoxy moiety or phenoxycarbonyl; an alkenyl group having 3–4 carbon atoms; an alkynyl group having 3–4 carbon atoms; benzyl group; an aliphatic acyl group having 2–4 carbon atoms; an alkoxycarbonyl gorup having 2–9 carbon atoms or a phenylalkoxycarbonyl group having 1–4 carbon atoms in the alkoxy moiety; n is 1 or 2 and, when n is 1, R_2 represents hydrogen atom; an alkyl group having 1–4 carbon atoms; a phenylalkyl group having 1–4carbon atoms in the alkyl moiety; or an aryl group which may be optionally substituted with halogen, hydroxy, nitro, alkyl having 1–4 carbon atoms, alkoxy having 1–4 carbon atoms or alkali metal sulfo; and R_3 represents an alkyl group having 1–18 carbon atoms; a halogenoalkyl group having 1–4 carbon atoms; an alkenyl group having 2–4 carbon atoms; an alkynyl group having 2–4 carbon atoms; a phenylalkyl group having 1–4 carbon atoms in the alkyl moiety; styryl group; an aryl group which may be optionally substituted with halogen, hydroxy, nitro, alkyl having 1–4 carbon atoms, alkoxy having 1–4 carbon atoms, alkali metal sulfo; a heterocyclic group; or

R_3 and R_2, together with the carbon atom to which they are attached, represent a cycloalkylidene group having 4–6 carbon atoms and, when n is 2, R_2 represents hydrogen atom and R_3 represents an alkylene group having 2–6 carbon atoms; or phenylene; or the carbon atoms, each of which is linked to R_3, are directly bonded.

3,887,518
SALICYLOYL-ACYL-HYDRAZINES

Siegfried Rosenberger, Riehen, and Kurt Schwarzenbach, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

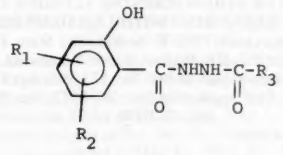
Division of Ser. No. 256,969, May 25, 1972, abandoned. This application Jan. 9, 1974, Ser. No. 431,996

Claims priority, application Switzerland, June 29, 1971, 9529/71

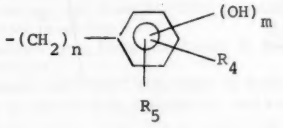
Int. Cl. C08f *45/60*

U.S. Cl. 260—45.9 NC **13 Claims**

1. A stabilized polyolefin containing a polyolefin and 0.01 to 5% of a stabilizer of the formula



in which R_1 denotes hydrogen, alkyl with 1 to 8 carbon atoms, alkenyl with 3 or 4 carbon atoms, cycloalkyl with 6 to 8 carbon atoms, aralkyl with 7 to 9 carbon atoms, phenyl, chlorine, hydroxyl, alkoxy with 1 to 18 carbon atoms, acyloxy with 2 to 18 carbon atoms or acylamino with 2 to 18 carbon atoms, R_2 denotes hydrogen, alkyl with 1 to 5 carbon atoms, alkenyl with 3 to 4 carbon atoms cyclohexyl, aralkyl with 7 to 9 carbon atoms, chlorine or hydroxyl, R_3 denotes alkyl with 2 to 21 carbon atoms, cyclohexyl or the radical



wherein m denotes 0 or 1 and n denotes 0 to 2, the difference n-m being not less than 0 if the OH group is in the o-position to the $-(CH_2)_n$ group, and wherein R_4 denotes hydrogen, alkyl with 1 to 8 carbon atoms, alkenyl with 3 or 4 carbon atoms, cycloalkyl with 6 to 8 carbon atoms, aralkyl with 7 to 9 carbon atoms, phenyl, chlorine, hydroxyl, alkoxy with 1 to 18 carbon atoms, acyloxy with 2 to 18 carbon atoms, or acylamino with 2 to 18 carbon atoms and R_5, if m is 1, denotes hydrogen, alkyl with 1 to 5 carbon atoms, alkenyl with 3 or 4 carbon atoms, cyclohexyl, aralkyl with 7 to 9 carbon atoms, chlorine or hydroxyl, or R_5, if m is 0, denotes hydrogen, alkyl with 1 to 8 carbon atoms, alkenyl with 3 or 4 carbon atoms, cycloalkyl with 6 to 8 carbon atoms, aralkyl with 7 to 9 carbon atoms, phenyl, chlorine, hydroxyl, alkoxy with 1 to 18 carbon atoms, acyloxy with 2 to 18 carbon atoms, or acylamino with 2 to 18 carbon atoms.

3,887,519
DIMETHYLTIN ESTER STABILIZERS FOR VINYL-HALIDE POLYMERS

Lewis B. Weisfeld, Princeton, N.J., and Robert C. Witman, Cincinnati, Ohio, assignors to Cincinnati Milacron Chemicals, Inc., Reading, Ohio

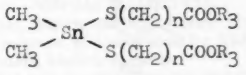
Continuation-in-part of Ser. Nos. 177,516, Sept. 2, 1971, and Ser. No. 317,228, Dec. 21, 1972, Pat. No. 3,810,868. This application Jan. 21, 1974, Ser. No. 435,264

Claims priority, application Germany, June 7, 1973, 2329039The portion of the term of this patent subsequent to May 14, 1991, has been disclaimed.

Int. Cl. C08f *45/62*

U.S. Cl. 260—45.75 K **30 Claims**

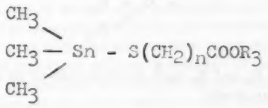
1. A composition comprising a halogen containing resin selected from the group consisting of chlorinated polyethylene a vinyl halide resin and a vinylidene halide resin with a stabilizingly effective amount of a mixture of (1) 60 to 96% of a compound having the formula



and (2) 4 to 40% of a compound having the formula

$$CH_3 - Sn - S(CH_2)_nCOOR_3)_3$$

and having not over 0.6% of



as an impurity in the stabilizer and where R_3 is hydrocarbon of up to 20 carbon atoms and n is an integer of 1 to 3.

3,887,520
STABILIZED POLYAMIDE COMPOSITION

Kiyoaki Nishijima, and Atsuo Tanaka, both of Mihara, Japan, assignors to Allied Chemical Corporation, Petersburg, Va.

Filed Jan. 30, 1974, Ser. No. 438,131

Int. Cl. C08g *51/62*

U.S. Cl. 260—45.75 C **3 Claims**

1. In a composition consisting essentially of a polyamide, containing, based on the weight of said polyamide,

a. from about 0.01 weight percent to about 5 weight percent 2-mercaptobenzimidazol, and

b. from about 10 parts per million to about 500 parts per million, analyzed as copper metal, of a compound selected from the group consisting of the copper salt of 2-mercaptobenzimidazol and an organic acid copper salt,

the improvement comprising said polyamide also containing

c. from about 5 parts per million to about 150 parts per million, analyzed as magnesium metal, of a compound selected from the group consisting of the magnesium salt of 2-mercaptobenzimidazol, and 8-hydroxyquinoline magnesium salt.

3,887,521

LIGHT-STABILIZED SYNTHETIC LINEAR POLYESTERS AND SHAPED STRUCTURES MADE THEREFROM

Erich Blöcker, Weilbach; Walter Rupp, Schneidhain, Taunus, and Franz Jakob, Hofheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, (Main) Germany

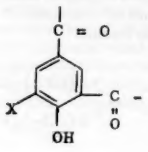
Filed May 10, 1974, Ser. No. 469,032

Claims priority, application Germany, May 14, 1973, 2324349

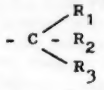
Int. Cl. C08g *17/14*

U.S. Cl. 260—47 C 8 Claims

1. Synthetic linear, fiber- and film-forming polyester the macromolecules of which are composed of dicarboxylic acid and diol moieties, wherein about 0.1 to 5 mole % of the dicarboxylic acid moieties are structural units of the formula



in which X stands for the group



wherein R_1, R_2 and R_3 each are hydrogen or an alkyl of from 1 to 4 carbon atoms.

3,887,522

SELF-EXTINGUISHING, FILM-FORMING, LINEAR POLYARYLATES

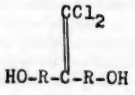
Zbigniew Brzozowski; Stanislaw Porejko; Jedrzej Kielkiewicz, and Janusz Kaczorowski, all of Warsaw, Poland, assignors to Politechnika Warszawska, Warsaw, Poland

Continuation-in-part of Ser. No. 331,247, Feb. 9, 1973, abandoned. This application May 24, 1974, Ser. No. 473,322

Int. Cl. C08g *17/08*

U.S. Cl. 260—47 C 14 Claims

1. A high molecular weight self-extinguishing, linear polyarylate of a dicarboxylic acid and a bisphenol said dicarboxylic acid consisting essentially of at least one phthalic acid and said bisphenol comprising at least one chlorobisphenol of the formula:



wherein each R is selected from the group consisting of phenyl and naphthyl and which may contain substituents selected from halogen and lower alkyl, said polyarylate being capable of forming a self-sustaining film.

3,887,523

FIBER-FORMING COPOLYESTER COMPOSITIONS FROM BROMINATED ETHOXYLATED HYDROQUINONE

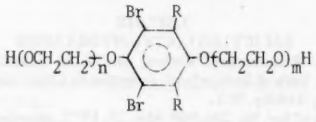
Chiou C. Yau; Irwin S. Schlossman, and Herman F. Oehlschlaeger, all of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Filed June 24, 1974, Ser. No. 482,198

Int. Cl. C08g *17/14*

U.S. Cl. 260—47 C 8 Claims

1. A flame retardant, thermally stable, fiber-forming copolyester comprising the condensation product of (a) a diol, (b) a dicarboxylic acid or a lower alkyl ester thereof and (c) a brominated ethoxylated hydroquinone of the formula



wherein R is hydrogen or bromine and n and m are integers from 1 to 4, said brominated ethoxylated hydroquinone comprising about 1 to 25% by weight of the copolyester composition.

3,887,524

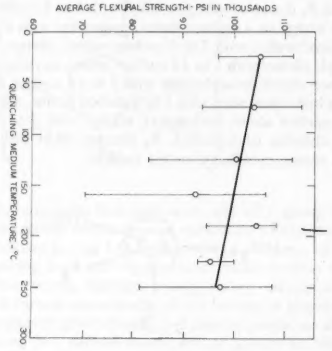
METHOD OF STRENGTHENING ALUMINA CERAMIC BY QUENCHING WITH LIQUID MEDIUM

Henry P. Kirchner, 700 S. Sparks St., State College, Pa. 16801, and Ralph E. Walker, Beaver Rd., Julian, Pa. 16844

Continuation-in-part of Ser. No. 131,595, April 6, 1971, abandoned. This application Dec. 20, 1972, Ser. No. 316,696

Int. Cl. B28b *11/00*

U.S. Cl. 264—66 18 Claims



1. A method of strengthening a polycrystalline alumina ceramic, comprising the steps of refiring an unglazed body consisting essentially of alumina ceramic having a grain size up to 50μm to a temperature of from 1400°C to between 1700° and 1750°C for a time sufficient to heat the body to be strengthened throughout, and quenching the body with a liquid medium which is at a temperature below about 250°C and no lower than room temperature and which is a medium taken from the group consisting of oils having a viscosity as low as 1.4 centistokes, said oils being mineral oil, petroleum oil, vegetable oil, and animal oil and emulsions of such oils in water with as little as 10% by weight of oil, whereby the flexural strength, tensile strength, impact resistance and thermal shock resistance is improved.

3,887,525
PROCESS FOR PREPARING SOLVENT-SOLUBLE POLYURETHANES

James Peter Brown; Edwin Gordon Jenner, and John Wilcock, all of Blackley, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 235,069, March 15, 1972, abandoned. This application Dec. 13, 1973, Ser. No. 424,424
Claims priority, application United Kingdom, Mar. 30, 1971, 8160/71
Int. Cl. C08g 22/14, 53/00, 53/20
U.S. Cl. 260—77.5 AA 10 Claims

1. A process for the manufacture of solvent-soluble polyurethane elastomers from polypropylene glycol having a molecular weight of 1,000–2,500, a diol having a molecular weight of at most 250 and an organic diisocyanate in amount at most equivalent to the polypropylene glycol and the diol together, which comprises (1) reacting together the organic diisocyanate and the polypropylene glycol in the absence of solvent to form an isocyanate-ended prepolymer, (2) further reacting the prepolymer with the diol in the absence of solvent to form a solvent-insoluble polyurethane product, (3) heating the solvent-insoluble polyurethane product in the absence of solvent until a product is obtained which is soluble in dimethyl formamide, dimethyl acetamide or dimethyl sulfoxide, (4) dissolving the solvent-soluble product in a solvent therefore and (5) removing the solvent to produce a solid polyurethane product.

3,887,526
PROCESS FOR THE HOMOPOLYMERIZATION OF MALEIC ANHYDRIDE

Charles J. Lancelot, Hightstown; John H. Blumbergs, Highland Park, both of N.J., and Donald G. MacKellar, Yardley, Pa., assignors to FMC Corporation, New York, N.Y.

Continuation of Ser. No. 248,880, May 1, 1972, Continuation-in-part of Ser. No. 51,730, July 1, 1970, abandoned. This application May 23, 1973, Ser. No. 363,015
Int. Cl. C08f 1/11, 3/48
U.S. Cl. 260—78.4 R 8 Claims

1. A process for the preparation of poly(maleic anhydride) which comprises,

adding at a controlled feed rate in the range from about 100 to 500 grams/liter/hour a feed mixture maintained at about 38°–50°C. which consists of maleic anhydride, an unsymmetrical acyl-maleyl peroxide initiator and a maleic anhydride solvent in which the maleic anhydride polymer product is insoluble,

to a polymerization reaction zone wherein is maintained a solvent system consisting essentially of a maleic anhydride solvent and about 0 to 25%, by weight, of maleic anhydride in solution,

said reaction zone being maintained at polymerization temperature,

precipitating poly(maleic anhydride) in the maleic anhydride solvent medium contained in said reaction zone, and

recovering and isolating the poly(maleic anhydride) product.

3,887,527
METHOD OF PRODUCING MALEIC ANHYDRIDE MODIFIED POLYISOPRENE RUBBER

Takayuki Okamura, and Shobu Minatono, both of Kashima, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed June 15, 1973, Ser. No. 370,380
Claims priority, application Japan, June 16, 1972, 47-60853
Int. Cl. C08f 27/00
U.S. Cl. 260—78.4 D 6 Claims

1. A method of producing modified polyisoprene rubber, comprising reacting maleic anhydride with a high cis-1,4-polyisoprene rubber having a cis-1,4 content of at least 95% by means of a radical-yielding catalyst, at a temperature of from about 0° to 150°C., in an inert solvent for said rubber as a reaction medium and under an atmosphere of an inert gas, characterized in that the maleic anhydride and the catalyst are respectively employed in amounts satisfying the conditions:

A. the amount of maleic anhydride is in the range of about 0.04 to 3 parts by weight per 100 parts by weight of the said rubber;

B. the value [amount of radical-yielding catalyst expressed in millimol per 100 g. of said rubber] × [initiator efficiency] is in the range of about 0.016 to 1.03; and

C. the value (A)/(B) is in the range of about 0.24 to 24.2 and conducting the reaction until a product having a bound maleic anhydride content of from about 0.03 to 0.9 mol per 100 recurring units of isoprene monomer in the polyisoprene polymer is obtained.

3,887,528
PRECIPITATION POLYMERIZATION OF 1:1 COPOLYMERIZATES OF MALEIC ACID ANHYDRIDE AND ALLYL ACETATE

Karlheinz Lottes, Munich, and Hans Katzer, Freising, both of Germany, assignors to Consortium fur Elektrochemische Industrie GmbH, Munich, Germany

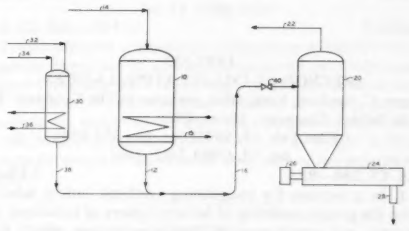
Filed June 11, 1973, Ser. No. 369,075
Claims priority, application Germany, June 9, 1972, 2228107
Int. Cl. C08f 1/11, 15/36
U.S. Cl. 260—78.5 R 14 Claims

1. A method of precipitation polymerization of 1:1 copolymerizates of maleic acid anhydride and allyl acetate consisting of polymerizing a solution of a monomer mixture of maleic acid anhydride and allyl acetate in an organic diluent in which said monomer mixture is soluble but the copolymer produced is substantially insoluble in the presence of at least one suspension aid and a free-radical-former selected from the group consisting of dialkyl peroxydicarbonates, dicycloalkyl peroxydicarbonates and lower alkyl esters of peracids at a temperature and time sufficient to effect polymerization, and recovering a 1:1 copolymerizate of maleic acid anhydride and allyl acetate.

3,887,529
PREVENTING PLUGS IN TRANSFER CONDUITS

Raymond G. Rohlfing, Kapellen, Belgium, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 20, 1973, Ser. No. 426,699
Int. Cl. C08g 23/00
U.S. Cl. 260—79 9 Claims



1. A method to prevent plugging of a transfer conduit through which a plug-forming material is passed when transferred from a first zone to a second zone, comprising: flushing said transfer conduit with a liquid which is a solvent for said plug-forming material wherein said solvent is at a temperature and pressure sufficient to maintain said solvent in the liquid phase in said transfer conduit but which causes at least a sufficient portion of said solvent to flash in said second zone to prevent said solvent from interfering with the processing of said plug-forming material in said second zone when said solvent is introduced into said second zone.

3,887,530

SEMI-CRYSTALLINE SULFONATED EDPM ELASTOMERIC IONOMERS

Charles P. O'Farrell, Clark, and Edward N. Kresge, Watchung, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Mar. 15, 1974, Ser. No. 451,384

Int. Cl. C08d *11/02, 13/30;* C08f *27/06*

U.S. Cl. 260—79.3 R 9 Claims

1. A sulfonated composition comprising an elastomeric EPDM having a number average molecular weight of about 5,000 to about 250,000, a crystallinity of at least 2% to about 50% as determined by X-ray diffraction at 25°C. and sulfonated to about 4×10^{-5} moles SO_3H per gram of polymer to about 5×10^{-4} moles SO_3H per gram of polymer, said sulfonic acid groups being substantially neutralized.

3,887,531

INTERPOLYMERS OF 5,8-DIMETHYL-1,4,9-DECATRIENE AND/OR 4,8-DIMETHYL-1,4,9-DECATRIENE WITH AT LEAST ONE ALPHAOLEFIN CONTAINING 2 TO 6 CARBON ATOMS

Wolfgang Schneider, Brecksville, and Robert J. Minchak, Parma Hts., both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 491,027, Sept. 28, 1965, abandoned. This application Nov. 1, 1967, Ser. No. 679,620

Claims priority, application Canada, Sept. 20, 1966, 970861

Int. Cl. C08f *15/14*

U.S. Cl. 260—80.78 6 Claims

1. An amorphous, sulfur-vulcanizable, elastomeric interpolymer containing at least two alpha-olefins containing 2 to 6 carbon atoms, at least one of which is ethylene, and from about 0.1 to less than 20 mol percent of dimethyl-1,4,9-decatriene selected from the group consisting of 5,8-dimethyl-1,4,9-decatriene and 4,8-dimethyl-1,4,9-decatriene and having a dilute solution viscosity of 0.5 to 5 determined in 0.2% solutions of interpolymer in toluene at 25°C.

3,887,532

METHOD OF COAGULATING LATICES

Terry C. Neubert, Kent, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 15, 1973, Ser. No. 332,850

Int. Cl. C08d *5/02, 5/04*

U.S. Cl. 260—85.1 9 Claims

1. In a process for coagulating synthetic latices selected from the group consisting of homopolymers of butadiene and styrene, and copolymers of butadiene/styrene which have been prepared using as emulsifiers, alkali metal salts of fatty acids and/or alkali metal salts of disproportionated rosin acids and selecting a coagulating salt from the group consisting of ferric chloride, ferric nitrate, ferric sulphate, aluminum chloride, aluminum nitrate, and aluminum sulphate, the improvement comprising heating a coagulation solution at a temperature between about 45°C. and about 95°C. before introducing said latices to the coagulation solution and adjusting equivalents of metal ion of said coagulating salt between 0.16 and about 0.56 per equivalent of said emulsifier and adding enough acid to maintain a final pH of less than 6.

3,887,533

PROCESS FOR THE MANUFACTURE OF A LIGHT COLORED THERMOSTABLE CHLORINATED POLYOLEFIN

Ambar Nath Mukerjee, Gersthofen, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 12, 1973, Ser. No. 424,201

Claims priority, application Germany, Dec. 21, 1972, 2262535

Int. Cl. C08f *27/03*

U.S. Cl. 260—88.2 5 Claims

1. In a process for the manufacture of a light colored thermostable chloropolyolefin by chlorinating pulverulent polyethylene, polypropylene or a copolymer of ethylene with a straight chain or branched α-olefin having 3 to 6 carbon atoms, the molecular weight of the polymer being in the range of from about 20,000 to 2,000,000, with gaseous chlorine in the fluidized or moving bed, possibly after a thermal treatment of the polymer, the improvement of carrying out the chlorination in the presence of 0.01 to 3.0% by weight, calculated on the amount of polymer to be chlorinated and uniformly dispersed therein, of a compound selected from the group consisting of

a. a saturated aliphatic mono- or dicarboxylic acid having 4 to 50 carbon atoms,
b. a mononuclear aromatic, possibly alkyl-substituted, monocarboxylic acid having 7 to 23 carbon atoms,
c. an aliphatic hydroxi-monocarboxylic acid having 2 to 18 carbon atoms in the molecule,
d. an aliphatic hydroxi-dicarboxylic acid having 4 to 10 carbon atoms,
e. an aromatic, possibly alkyl-substituted, hydroxicarboxylic acid having 7 to 11 carbon atoms,
f. an alkali metal or alkaline earth metal salt of any one of the acids named sub (a) to (e),
g. an anhydride of an aliphatic monocarboxylic acid having 4 to 50 carbon atoms,
h. an anhydride of an aliphatic dicarboxylic acid having 4 to 50 carbon atoms,
i. an anhydride of an aromatic monocarboxylic acid having 7 to 23 carbon atoms, and
j. an anhydride of an aromatic dicarboxylic acid having 8 to 23 carbon atoms.

3,887,534

METHOD FOR PRODUCING A MODIFIED CRYSTALLINE PROPYLENE POLYMER

Kazuo Baba; Toshiaki Shiota; Kikuo Murakami, all of Nilhama, and Kazuo Ono, Ehime-ken, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka-fu, Japan

Filed Mar. 9, 1973, Ser. No. 339,927

Claims priority, application Japan, Mar. 11, 1972, 47-24933

Int. Cl. C08f *27/22, 27/00, 3/10*

U.S. Cl. 260—93.7 15 Claims

1. A method for the modification of crystalline propylene polymer which comprises heating a mixture comprising 100 parts by weight of said polymer and 0.001 to 0.5 part by weight of an aliphatic peroxide at a temperature of from 170 to 280°C, said peroxide having a half life time of from 2.0 to 10.0 hours at 130°C and a vapor pressure of not more than 760 mmHg at 230°C.

3,887,535

PROCESS FOR PRODUCING RUBBERY CONJUGATED DIOLEFIN POLYMERS HAVING BRANCHED STRUCTURES

Saburo Minekawa; Sigeru Yonekawa; Haruro Tabata, all of Yokohama; Takashi Ishida, Kamakura; Satoshi Tsuchida, Yokohama, and Kiyoshi Yamada, Kawasaki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 12,657, Feb. 19, 1970, abandoned, and a continuation-in-part of Ser. No. 688,788, Dec. 7, 1967, abandoned. This application May 8, 1972, Ser. No. 251,110
Claims priority, application Japan, Dec. 16, 1966, 41-82029
Int. Cl. C08d *3/04*; C08f *3/16*
U.S. Cl. 260—94.2 M 5 Claims

1. Process for producing a rubbery polymer having a branched structure, which comprises

bringing continuously into a polymerization zone a mixture consisting of a conjugated diolefin having from 4 to 5 carbon atoms per molecule and selected from the group consisting of 1,3-butadiene, 2-methyl-1,3-butadiene and 1,3-pentadiene, a hydrocarbon diluent selected from the group consisting of a paraffinic, cycloparaffinic and aromatic hydrocarbon having from 5 to 12 carbon atoms per molecule and a C_7-C_8 alkyllithium catalyst and at a predetermined temperature of from about 90° to about 235°C. to initiate polymerization of said diolefin therein, and

continuing the polymerization of said conjugated diolefin while maintaining the polymerization themperature within said specified range of from about 90° to about 235°C. with a continuous addition of said conjugated diolefin, said hydrocarbon diluent and said catalyst to form said rubbery polymer,

the initiation and continuation of said polymerization being carried out under polymerization conditions in which k_i is greater than k_p.

3,887,536

PROCESS FOR PREPARING POLY-1,4-TRANS BUTADIENE

Masaru Ichikawa, and Tamio Noguchi, Sagamihara, both of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

Filed June 1, 1973, Ser. No. 365,826
Claims priority, application Japan, June 9, 1972, 47-56892; Aug. 24, 1972, 47-84095
Int. Cl. C08d *3/08*
U.S. Cl. 260—94.2 2 Claims

1. A process for preparing polybutadiene of predominantly trans 1,4 structure which comprises:

polymerizing butadiene in the presence of a catalyst consisting of:

1. a metal selected from the group consisting of sodium, potassium, rubidium and cesium, and
2. an alkylamine or an alkenylamine

in an atmosphere at a temperature of from −20°C to 70°C at the weight ratio of metal to alkylamine or alkenylamine being about 1:10–10:1.

3,887,537

PROCESS FOR RECOVERING FATTY ACIDS AND/OR ROSIN ACIDS

Tetsuya Harada, Tokyo, and Tsunemasa Yumoto, Yokohama, both of Japan, assignors to Japan Synthetic Rubber Company Limited, Japan

Filed Sept. 6, 1974, Ser. No. 503,873
Claims priority, application Japan, Sept. 18, 1973, 48-105258
Int. Cl. C09f *8/07*
U.S. Cl. 260—97.6 4 Claims

1. A process for recovering fatty acids and/or rosin acids which comprises the steps of saponifying a tall oil head and/or pitch, introducing the saponified material into a thin film evaporator equipped with a rake and having a clearance of not more than one millimeter between the blade tips and the surrounding tube wall, evaporating and removing the low-boiling matter including unsaponifiables by a treatment at a temperature not lower than the melting point of the resulting soaps, and thereafter decomposing the saponification products.

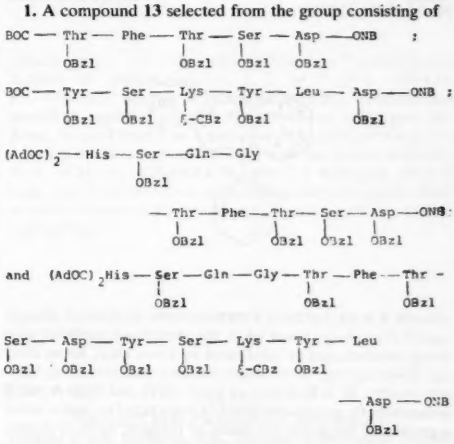
3,887,538

PROCESS FOR SELECTIVELY CLEAVING CARBOXYL PROTECTING GROUPS FROM MULTI-CARBOXYL PEPTIDES OR AMINO ACIDS AND COMPOUNDS USEFUL THEREIN

James E. Shields, and Edward L. Smithwick, Jr., both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 19, 1971, Ser. No. 200,607
Int. Cl. C07c *103/52*, *101/00*; C07d *27/00*
U.S. Cl. 260—112.5 4 Claims

1. A compound 13 selected from the group consisting of


BOC — Thr — Phe — Thr — Ser — Asp — ONB ;
OBzl OBzl OBzl OBzl
BOC — Tyr — Ser — Lys — Tyr — Leu — Asp — ONB ;
OBzl OBzl ε-CBz OBzl OBzl
(AdOC)2 — His — Ser — Gln — Gly
OBzl
— Thr — Phe — Thr — Ser — Asp — ONB ;
OBzl OBzl OBzl OBzl
and (AdOC)2 His — Ser — Gln — Gly — Thr — Phe — Thr —
OBzl OBzl OBzl
Ser — Asp — Tyr — Ser — Lys — Tyr — Leu
OBzl OBzl OBzl OBzl ε-CBz OBzl
— Asp — ONB
OBzl

3,887,539

ADHESIVE COMPOSITIONS

Bruce P. Barth, Somerville, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Apr. 30, 1973, Ser. No. 355,677
Int. Cl. C08g *5/20*
U.S. Cl. 260—19 UA 3 Claims

1. An adhesive composition comprising a mixture of an aqueous dispersion of an alkaline catalyzed para-substituted phenol-formaldehyde resin having a labile formaldehyde content of about 0 weight percent to about 12 weight percent, based on the weight of the resin and a polychloroprene latex, in which there is present about 0.05 part by weight to about 2 parts by weight of the resin for each part of the polychloroprene.

3,887,540

COUPLING PROCESS FOR SUBSTITUTED AMINOAZOBENZENESULFONIC ACIDS

Arturo Gabriel Bellettini, Newark, and Richard Crawford Franklin, Wilmington, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 23, 1971, Ser. No. 201,567
Int. Cl. C07c *107/06*; C09b *29/08*, *29/26*
U.S. Cl. 260—205 2 Claims

1. In the process of coupling metanilic acid diazonium salt or sulfanilic acid diazonium salt directly to the ring of a pripmary aryl amine under acidic conditions, the improvement

insisting essentially of coupling to a primary aryl amine selected from the group consisting of ortho-anisidine, ortho-toluidine, and aniline, at a pH between 0.2 to 1.5 and at a temperature from about 5°C. to 30°C., wherein the initial pH is about 0.2 to 0.5 and is raised as reaction progresses by adding mild alkali and the initial temperature is about 5°C. to 15°C. and is gradually raised to about 20°C. to 30°C.

3,887,541

1,4-BENZODIAZEPINE DERIVATIVES

Hiroyuki Tawada, Kyoto; Kanji Meguro, and Yutaka Kuwada, both of Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

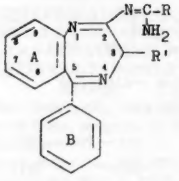
Division of Ser. No. 90,139, Nov. 16, 1970, Pat. No. 3,703,525. This application Sept. 13, 1972, Ser. No. 288,544

Claims priority, application Japan, Nov. 15, 1969, 44-91720

Int. Cl. C07d *53/06*

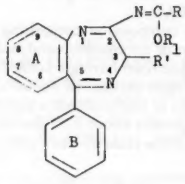
U.S. Cl. 260—239 BD **8 Claims**

1. A member selected from the group consisting of a compound of the formula



wherein R is alkyl of up to 8 carbon atoms, cyclohexyl, phenyl, naphthyl or phenyl lower alkyl, the phenyl and naphthyl rings being unsubstituted or substituted by lower alkyl, lower alkenyl, lower alkoxy, lower alkanoylamino, benzoylamino, halogen or nitro, R′ is hydrogen or lower alkyl, and rings A and B independently are unsubstituted or substituted by one or more members of the group consisting of halogen, nitro, trifluoromethyl, alkyl of up to 6 carbon atoms, cyclohexyl and alkoxy of up to 4 carbon atoms, a corresponding 4N-oxide thereof and a pharmaceutically acceptable acid salt thereof.

7. A member selected from the group consisting of a compound of the formula



wherein R is alkyl of up to 8 carbon atoms, cyclohexyl, phenyl; naphthyl or phenyl lower alkyl, the phenyl and naphthyl rings being unsubstituted or substituted by lower alkyl, lower alkenyl, lower alkoxy, lower alkanoylamino, benzoylamino, halogen or nitro, R′ is hydrogen or lower alkyl, R_1 is lower alkyl, and rings A and B independently are unsubstituted or substituted by one or more members of the group consisting of halogen, nitro, trifluoromethyl, alkyl of up to 6 carbon atoms, cyclohexyl and alkoxy of up to 4 carbon atoms, a corresponding 4N-oxide thereof and a pharmaceutically acceptable acid salt thereof.

3,887,542

POLYISOCYANATE AND POLYISOTHIOCYANATE DERIVATIVES OF 6-AMINOPENICILLANIC ACID

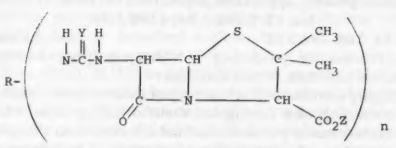
Donald J. Perrella, Princeton Junction, and Joseph E. Dolfini, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sept. 22, 1972, Ser. No. 291,439

Int. Cl. C07d *99/22*

U.S. Cl. 260—239.1 **8 Claims**

1. A compound of the formula



wherein Y is oxygen or sulfur, Z is hydrogen, a physiologically acceptable metal, NH_4, triethylamine, procaine, dibenzylamine, N-benzyl-β-phenethylamine, N,N′-dibenzylethylenediamine, N-ethyl-piperidine, or an alkyl group of from 1 to 7 carbon atoms, and R is an alkyl group of from 1 to 10 carbon atoms, a monocyclic alicyclic group of 5 or 6 carbon atoms in the ring; an aromatic carbocyclic 6-membered ring which may be joined to a second aromatic carbocyclic 6-membered ring directly or through a methylene group, or an aromatic carbocyclic 6-membered ring which may be substituted by one or two divalent alkyl groups of 1 or 2 carbon atoms; or a 5- or 6-membered monoheterocyclic group wherein the heteroatom is N, O or S, or a 5- or 6-membered diheterocyclic group wherein each heteroatom is N and n is 2 or 3.

3,887,543

THIENO(2,3-E)(1,4)DIAZEPINE DERIVATIVES

Michio Nakanishi, Oita; Masami Shiroki; Tetsuya Tahara, both of Fukuoka, and Kazuhiko Araki, Fukuoka, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

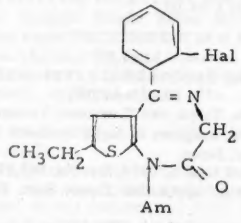
Continuation-in-part of Ser. No. 205,765, Dec. 7, 1971, abandoned. This application Jan. 29, 1974, Ser. No. 437,590

Claims priority, application Japan, Dec. 7, 1970, 45-108818; Dec. 19, 1970, 45-114680

Int. Cl. C07d *99/06*

U.S. Cl. 260—239.3 B **3 Claims**

1. A thieno[2,3-3][1,4]diazepine compound of the formula:



wherein Hal is a halogen atom, and Am is an $-NH_2$ or $-CONHCH_3$ group; and a pharmaceutically acceptable acid addition salt thereof.

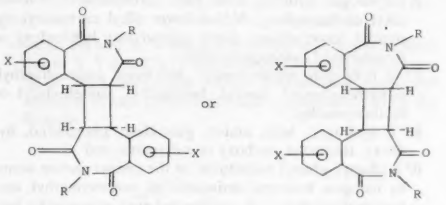
3,887,544

CYCLOBUTABISBENZAZEPINETETRONE COMPOUNDS

Berthold Richard Vogt, Yardley, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed July 1, 1974, Ser. No. 484,908
Int. Cl. C07d *41/00, 41/08*
U.S. Cl. 260—239.3 P 3 Claims

1. A compound of the formula



wherein X is hydrogen, alkyl of from 1 to 4 carbons, alkoxy of from 1 to 4 carbons, halogen, CF_3, NO_2, wherein R is H, alkyl of from 1 to 4 carbons, allyl or dialkylaminoalkyl wherein each alkyl group may have from 1 to 3 carbon atoms, and pharmaceutically acceptable acid addition salts thereof when R is dialkylamino alkyl as previously defined.

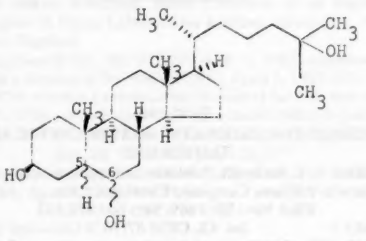
3,887,545

SYNTHESIS OF 1α-HYDROXYLATED CHOLESTEROL DERIVATIVES

Jerome Anthony Iacobelli, Woodside; Thomas Albert Narwid, Pompton Plains, and Milan Radoje Uskokovic, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Nov. 12, 1973, Ser. No. 415,186
Int. Cl.[2] C07C *173/00*
U.S. Cl. 260—239.55 R 28 Claims

1. A compound of the formula



with the proviso that the hydrogen atom in the 5-position and the hydroxyl group in the 6-position are cis to each other.

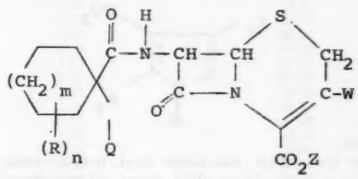
3,887,546

1-AMINO SUBSTITUTED 1-CYCLOALKANE DERIVATIVES OF 7-AMINOCEPHALOSPORANIC ACID AND 7-AMINODESACETOXY CEPHALOSPORANIC ACID

Bong Kuk Lee, Old Bridge; Saul Lewis Neidleman, Trenton, both of N.J., and Dewey D. Y. Ryu, Holliston, Mass., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 21, 1972, Ser. No. 282,097
Int. Cl. C07d *99/24*
U.S. Cl. 260—240 G 8 Claims

1. A compound of the formula



wherein *m* is 0, 1 or 2; R is alkyl of from 1 to 7 carbon atoms, hydroxy or halogen; *n* is 0, 1, 2, or 3; Q is —N=CH-R^1—$NHCH_2R^1$ wherein R^1 is phenyl, naphthyl, or substituted phenyl or naphthyl wherein the substituent is halogen, hydroxy, alkyl of from 1 to 4 carbon atoms, alkoxy of from 1 to 4 carbon atoms, or acyl of from 1 to 4 carbon atoms, or amido; W is $—CH_3$ or $—CH_2OCOCH_3$; and Z is hydrogen, alkyl of from 1 to 7 carbon atoms, a physiologically acceptable alkali metal or alkaline earth metal, or a physiologically acceptable organic base.

3,887,547

PROCESS FOR PREPARING dl-STRIGOL

Charles J. Sih, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Mar. 13, 1974, Ser. No. 450,950
Int. Cl. C07d *5/14*; C07c *61/00*
U.S. Cl. 260—240 R 2 Claims

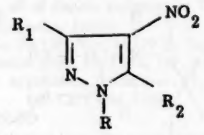
1. The process for preparing dl-strigol which comprises:
brominating 3-oxo-2,6,6-trimethylcyclohex-1-en-1-carboxylic acid and separating the corresponding 2-bromomethyl-substituted carboxylic acid
methylating the said 2-bromomethyl-substituted carboxylic acid to obtain the corresponding methyl ester
contacting the said ester with dimethyl malonate and sodium methoxide in solvent solution and recovering methyl 1,4-diketo-7,7-dimethyl-2,3,5,6-tetrahydroindane-2-carboxylate in admixture with its enol form from the reaction mixture
subjecting the said keto and enol esters to alkylation and subsequent hydrolysis with spontaneous decarboxylation to obtain methyl 1,4-diketo-7,7-dimethyl-2,3,5,6-tetrahydroindane-2-carboxylic acid
subjecting the aforesaid diketo carboxylic acid to a hydride reducing agent and recoverying the resulting 1α,4α-dihydroxy-7,7-dimethyl-2,3,5,6-tetrahydroindane-2α-acetic acid α and β lactones in admixture from the reaction mixture
separating the said α-lactone from the said β-lactone formylating the said α-lactone and recovering the corresponding hydroxy methylene lactone alkylating the said hydroxy methylene lactone with bromobutenolide and recovering dl-strigol and dl-4′-epi strigol from the reaction mixture.

3,887,548
PYRAZOLE DERIVATIVES

Hans Bruderer, Benken; Rolf Richle, Mohlin, and Rudolf Ruegg, Bottmingen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

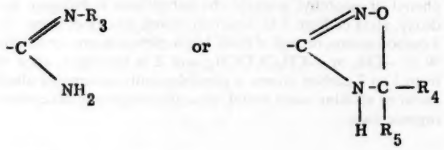
Division of Ser. No. 296,691, Oct. 11, 1972, Pat. No. 3,822,283. This application Apr. 8, 1974, Ser. No. 459,149
Claims priority, application Switzerland, Oct. 22, 1971, 15404/71; Sept. 12, 1972, 13327/72
Int. Cl. C07d *85/52, 49/18*
U.S. Cl. 260—240 A **42 Claims**

1. A compound of the formula



wherein

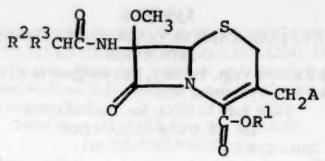
R is lower alkyl, halo-lower alkyl, hydroxy-lower alkyl, lower alkoxy-lower alkyl, lower alkoxycarbonyl-lower alkyl, carboxy-lower alkyl or lower alkenyl; R_1 is hydrogen, halogen, lower alkyl or lower alkoxy and R_2 is a radical of the formula



wherein

R_3 is lower alkanoyloxy, lower alkoxycarbonyloxy, phenylcarbonyloxy, lower alkyl-phenylcarbonyloxy, lower alkoxy-phenylcarbonyloxy, halo-phenylcarbonyloxy, phenyl-(lower alkylcarbonyloxy), lower alkyl-phenyl-(lower alkyl-carbonyloxy), lower alkoxy-phenyl-(lower alkylcarbonyloxy), halo-phenyl-(lower alkylcarbonyloxy), phenyl-(lower alkenyl-carbonyloxy), lower alkyl-phenyl-(lower alkenylcarbonyloxy), lower alkoxy-phenyl-(lower alkenylcarbonyloxy), halo-phenyl- (lower alkenylcarbonyloxy), pyridyl-(lower alkylcarbonyloxy), lower alkyl-pyridyl-(lower alkylcarbonyloxy), lower alkoxy-pyridyl-(lower alkylcarbonyloxy), halo-pyridyl-(lower alkylcarbonyloxy), pyridylcarbonyloxy, lower alkyl-pyridylcarbonyloxy, lower alkoxy-pyridylcarbonyloxy or halo-pyridylcarbonyloxy; R_4 is lower alkyl or phenyl; and R_5 is hydrogen or lower alkyl or R_4 and R_5, taken together with the carbon to which they are attached, are a 5-, 6- or 7-membered alicyclic ring,

or a pharmaceutically acceptable acid addition salt thereof.



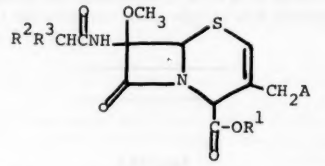
wherein

A is hydrogen, hydroxy, azido, halo, carbamoyloxy, N-lower alkyl carbamoyloxy; N,N-di-lower alkyl carbamoyloxy, pyridyl, lower alkoxy, lower alkanoyloxy benzoyloxy or 5-membered heterocyclic thio;

R^1 is hydrogen, trichloroethyl, tert-butyl, benzoylmethyl, p-methoxybenzyl, benzyl, benzhydryl, trimethylsilyl or methoxymethyl;

R^2 is hydrogen, halo, amino, guanidino, phosphono, hydroxy, tetrazolyl, carboxy or sulfamino; and

R^3 is phenyl, phenyl substituted on the phenyl carbon atoms by halogen, hydroxy, aminomethyl, carboxymethyl, carboxamidomethyl; a 5- or 6-membered monocyclic heterocycle containing one or more oxygen, sulfur or nitrogen atoms in the ring, substituted heterocycles wherein the substituent is halo, carboxymethyl, guanidino, guanidinomethyl, carboxamidomethyl, aminomethyl, nitro, methoxy or methyl; phenylthio, pyridylthio and substituted pyridylthio wherein the substituents are halo, carboxymethyl, guanidino, guanidinomethyl, carboxamidomethyl, aminomethyl, nitro, methoxy, methyl or cyano, which comprises dissolving a compound of the formula:



wherein A, R^1, R^2 and R^3 are as defined above in an inert solvent and treating said solution for 5 hours to 3 days or until isomerization is complete with an isomerizing agent selected from the group of inorganic bases consisting of alkali metal carbonates and hydroxides, alkaline earth metal carbonates and hydroxides, alumina and silica gel, wherein said inert solvent is water with a water miscible organic solvent.

3,887,549
PROCESS FOR PREPARING 7-ACYLAMIDO-7-METHOXY-3-CEPHEM-4-CARBOXYLIC ACID, ESTERS AND SALTS

Burton G. Christensen, Scotch Plains, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 200,587, Nov. 19, 1971, abandoned. This application Apr. 12, 1972, Ser. No. 243,438
Int. Cl. C07d *99/24*
U.S. Cl. 260—243 C **13 Claims**

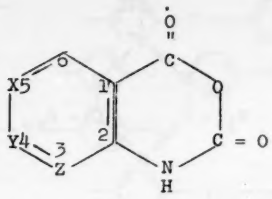
1. The process for preparing a compound of the formula:

3,887,550
METHOD FOR PRODUCING HETEROCYCLIC ACID ANHYDRIDES

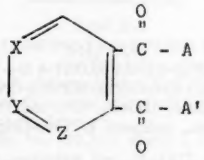
Athelstan L. J. Beckwith, Adelaide, Australia, assignor to The Sherwin-Williams Company, Cleveland, Okla.

Filed Nov. 20, 1969, Ser. No. 878,552
Int. Cl. C07d *87/10*
U.S. Cl. 260—244 R **3 Claims**

1. A method for producing heterocyclic acid anhydrides having the formula,



wherein each of X, Y and Z is N or CH and, not more than one of X, Y and Z is N, said method comprising dissolving in an inert anhydrous solvent substantially equivalent amounts of lead tetraacetate and a compound having the formula



wherein one of A and A′ is OH and the other is NH_2 and not more than one of X, Y and Z is N, with the proviso that when Z is nitrogen A is OH and A′ is NH_2, agitating the reaction mixture at a temperature sufficiently high that reaction occurs and recovering the acid anhydride.

Interplanar Spacing A	2Θ (CuKα), degrees
14.6	6.05
7.38	11.97
6.82	12.97
6.39	13.85
5.68	15.57
5.57	15.90
5.29	16.75
4.92	18.02
4.80	18.47
4.49	19.77
4.22	21.05
4.08	21.77
3.89	22.85
3.82	23.27
3.74	23.77
3.69	24.07
3.66	24.27
3.55	25.00
3.47	25.62
3.38	26.30
3.35	26.57
3.29	27.05
3.20	27.82
3.14	28.40
3.08	28.97
3.00	29.75
2.96	30.20
2.82	31.67
2.77	32.30
2.73	32.80
2.67	33.50
2.65	33.77
2.58	34.70
2.55	35.12
2.54	35.25
2.51	35.72
2.47	36.35
2.43	36.90
2.41	37.27
2.37	37.90
2.35	38.30
2.32	38.80
2.24	40.15
2.18	41.35
2.14	42.25.

3,887,551

CRYSTALLINE FORMS OF CEPHALORIDINE

Harold Alfred Crisp, Harrow Weald; John Francis Oughton, Gerrards Cross; Christopher John Sharp, Northolt, and Peter Alfred Wilkinson, South Croydon, all of England, assignors to Glaxo Laboratories Limited, Greenford, Middlesex, England

Continuation of Ser. No. 862,790, Oct. 1, 1969, abandoned, which is a division of Ser. No. 627,933, April 3, 1967, Pat. No. 3,498,979, which is a continuation-in-part of Ser. No. 605,474, Dec. 28, 1966, abandoned, which is a continuation-in-part of Ser. No. 408,919, Nov. 4, 1964, abandoned. This application Jan. 24, 1972, Ser. No. 220,537

Claims priority, application United Kingdom, Nov. 4, 1964, 29857/64; Apr. 7, 1966, 15719/66

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **2 Claims**

1. The crystalline form of N-(7-2′-thienylacetamidoceph-3-em-3-ylmethyl) pyridinium-4-carboxylate characterized by the following X-ray diffraction data:

Interplanar Spacing A	2Θ (CuKα), degrees
14.48	6.10
8.32	10.62
7.43	11.90
6.79	13.02
6.46	13.70
6.01	14.72
5.77	15.35
5.65	15.67
5.56	15.92
5.35	16.55
5.29	16.75
4.94	17.92
4.82	18.40
4.62	19.20
4.51	19.67
4.33	20.47
4.30	20.62
4.22	21.02
4.09	21.70
3.97	22.37
3.86	23.05
3.79	23.42
3.70	24.02
3.65	24.40
3.63	24.52
3.58	24.85
3.53	25.20
3.50	25.42
3.42	26.00
3.41	26.15
3.35	26.62
3.31	26.90
3.24	27.55
3.17	28.10
3.07	29.10
3.01	29.67
2.98	29.95

2. The crystalline form of N-(7-2′-thienylacetamidoceph-3-em-3-ylmethyl) pyridinium-4-carboxylate characterized by the following X-ray diffraction data:

2.87	31.10
2.82	31.67
2.79	32.10
2.77	32.32
2.70	33.10
2.68	33.40
2.62	34.20
2.59	34.65
2.562	35.00
2.558	35.05
2.48	36.12
2.46	36.45
2.43	36.97
2.39	37.62
2.37	37.97
2.35	38.30
2.32	38.82
2.30	39.27
2.26	39.92
2.24	40.30
2.23	40.42
2.21	40.77
2.18	41.47
2.15	42.00
2.12	42.67.

3,887,552

5-OXO-2,3-DIHYDRO-IMIDAZO(1,2-A)-S-TRIAZINES

Helmut Stähle; Herbert Köppe; Werner Kummer, all of Ingelheim am Rhein, and Wolfgang Hoefke, Budenheim, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

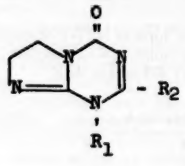
Filed Mar. 12, 1974, Ser. No. 450,289

Claims priority, application Germany, Mar. 23, 1973, 2314488

Int. Cl. C07d *57/34*

U.S. Cl. 260—249.5 **14 Claims**

1. A compound of the formula



wherein R_1 is phenyl or mono-, di- or tri-substituted phenyl, the substituents being each selected from the group consisting of halogen, methyl, methoxy and trifluoromethyl, and R_2 is hydrogen, phenyl or halo-phenyl.

3,887,553

PROCESS FOR THE MANUFACTURE OF PHOSPHORUS-CONTAINING CONDENSATION PRODUCTS

Hermann Nachbur, Dornach, and Arthur Maeder, Therwil, both of Switzerland, assignors to Ciba-Geigy AG, Basle, Switzerland

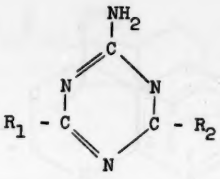
Filed Aug. 31, 1972, Ser. No. 285,383

Claims priority, application Switzerland, Jan. 14, 1972, 521/72

Int. Cl. C07d *55/24*

U.S. Cl. 260—249.6 **10 Claims**

1. A process for the manufacture of a water-soluble condensation product of a tetrakis-(hydroxymethyl)-phosphonium compound and a 1,3,5-triazine, consisting essentially of the step of condensing in the melt or in an aqueous medium 1 mol of a tetrakis-(hydroxymethyl)-phosphonium salt or hydroxide at 40° to 120°C with 0.02 to 0.1 mol of a 1,3,5-triazine of the formula



wherein

R_1 is amino, hydroxyl or hydrogen,

R_2 is amino, hydroxyl, hydrogen, methyl, phenyl or 1-dialkylphosphono-(alkyl)$_{n-1}$ wherein the moieties have 1 to 6 carbon atoms, and

n is 1 or 2,

or with a methylolated 1,3,5-triazine of the above formula.

3,887,554

2(4)-ANILINO-4(2)-HYDROXY-6 H-s-TRIAZINO (2,1-b)-QUINAZOLINE-6-ONE

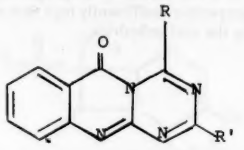
Roland A. E. Winter, Armonk, N.Y., and Thomas J. Villani, Danbury, Conn., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 129,128, March 29, 1971, abandoned. This application Apr. 13, 1973, Ser. No. 351,127

Int. Cl. C07d *57/34*

U.S. Cl. 260—249.8 **4 Claims**

1. A compound having the formula:



wherein R and R′ are hydroxy or anilino groups provided that said R and R′ are different.

3,887,555

TETRATOSYLATE OR TETRAAMINO PHENYLATED QUINOXALINE MONOMERS AND METHOD OF SYNTHESIS

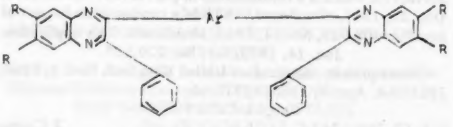
Fred R. Arnold, Centerville, and Robert F. Kovar, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 292,368, Sept. 26, 1972, Pat. No. 3,740,374. This application Mar. 26, 1973, Ser. No. 344,787

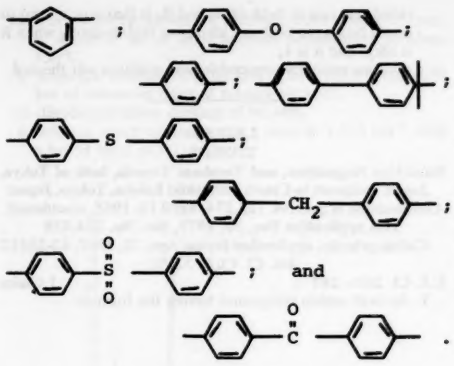
Int. Cl. C07d *51/78*

U.S. Cl. 260—250 Q **4 Claims**

1. A compound having the following formula:



wherein R is NH_2 or TosNH and Ar is one of the following radicals:



3,887,556

ANTIMYCOTIC DIPHENYL-IMIDAZOLYL-PYRIMIDYL METHANES

Wilfried Draber; Karl Heinz Büchel; Erik Regel, and Manfred Plempel, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Germany

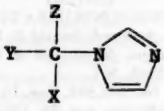
Division of Ser. No. 120,333, March 2, 1971, Pat. No. 3,787,415. This application Nov. 29, 1972, Ser. No. 310,423

Claims priority, application Germany, Mar. 23, 1970, 2013793

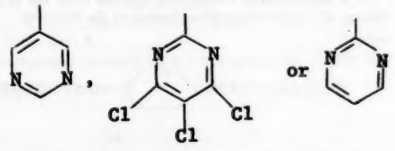
Int. Cl. C07d *51/36*

U.S. Cl. 260—256.4 R 7 Claims

1. A compound of the formula:



wherein

X is 

Y is phenyl or p-fluorophenyl, and
Z is phenyl.

3,887,557

PIPERAZINE DERIVATIVES AND PROCESSES FOR PREPARATION THEREOF

Shinsaku Minami, Yamato-Kouriyama; Jun-Ichi Matsumoto, Takatsuki; Kazuyo Kawaguchi, Nara; Shinsaku Mishio, Osaka; Masanao Shimizu, Kobe; Yoshiyuki Takase, Amagasaki, and Shinichi Nakamura, Takatsuki, all of Japan, assignors to Dainippon Pharmaceutical Co. Ltd., Osaka, Japan

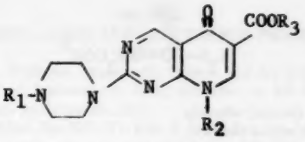
Filed Aug. 8, 1973, Ser. No. 386,626

Claims priority, application Japan, Aug. 14, 1972, 47-81288

Int. Cl. C07d *51/42*

U.S. Cl. 260—256.4 F 12 Claims

1. Compounds of the formula



[I]

wherein R_1 is a moiety selected from one of the group consisting cf hydrogen, alkyl having 1 to 4 carbon atoms, hydroxyalkyl having 2 to 4 carbon atoms, benzyl, benzyl substituted by methoxy, phenyl, propargyl, or acyl selected from the group consisting of lower alkanoyl, trifluoroacetyl lower alkoxycarbonyl and phenyl-substituted lower alkoxycarbonyl, R_2 is a moiety selected from one of the group consisting of hydrogen, alkyl having 1 to 4 carbon atoms, alkyl having 2 to 4 carbon atoms substituted by hydroxy or halogen, vinyl, allyl or benzyl, and R_3 is a moiety selected from one of the group consisting of hydrogen or alkyl having 1 to 6 carbon atoms; and pharmaceutically effective organic and inorganic salts thereof.

3,887,558

PROCESS FOR PRODUCING 2,6-DIAMINO -1,4-DIHYDRO-3,5-PYRIDINE-DICARBOXYLATES AND DERIVATIVES THEREOF

Horst Meyer; Friedrich Bossert, both of Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal-Vohwinkel, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

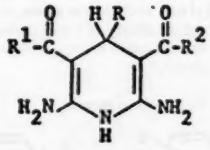
Filed Mar. 27, 1974, Ser. No. 454,997

Claims priority, application Germany, Mar. 6, 1972, 2210687

Int. Cl.[2] C07D *51/36, 31/36*

U.S. Cl. 260—256.4 C 33 Claims

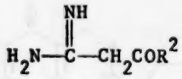
1. A process for the production of a compound of the formula



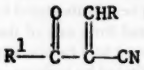
wherein

R is hydrogen; lower alkyl; alkenyl of 2 to 4 carbon atoms; alkynyl of 2 to 4 carbon atoms, phenyl; substituted phenyl in which the substituents are one to three members selected from the group consisting of lower alkyl, lower alkoxy, halogeno, nitro, cyano, trifluoromethyl, azido, carbo(lower alkoxy), lower alkylsulfonyl, lower alkylsulfinyl, and lower alkylthio; bi-phenyl; naphthyl; or a heterocyclic ring selected from the group consisting of quinolyl, isoquinolyl, pyridyl, pyrimidyl, thenyl, furyl and pyrryl, said heterocyclic ring being unsubstituted or substituted by one or two members selected from the group consisting of lower alkyl, lower alkoxy and halogeno; and each of R^1 and R^2, taken independently of the other, is lower alkoxy, lower alkoxy(lower alkoxy), alkenyloxy of 2 to 4 carbon atoms, alkynyloxy of 2 to 4 carbon atoms, amino, lower alkylamino or di(lower alkyl)amino;

which comprises reacting an amidine of the formula



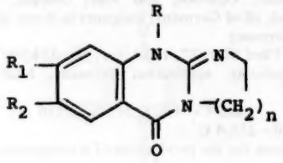
or a salt thereof, wherein
R^2 is as above defined;
with
a. an aldehyde of the formula RCHO, wherein R is as above defined, in an inert organis colvent to produce a compound as above defined wherein R^1 is the same as R^2; or
b. an ylidene cyanoacetic acid of the formula



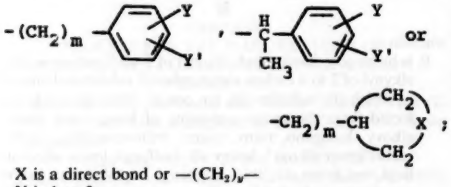
wherein R and R^1 are as above defined; in an inert solvent and in the presence of an alkali metal alkoxide, the reaction temperature being from 20° to 200°C, and recovering the compound produced.

3,887,559
PHARMACOLOGICALLY ACTIVE TRICYCLIC QUINAZOLINONES
Guetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz, Inc., East Hanover, N.J.
Continuation-in-part of Ser. No. 163,105, July 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 87,016, Nov. 4, 1970, abandoned, which is a continuation-in-part of Ser. No. 828,757, May 28, 1969, Pat. No. 3,598,823. This application Jan. 19, 1973, Ser. No. 324,996
Int. Cl. C07d *51/42*
U.S. Cl. 260—256.4 F **52 Claims**

1. A compound of the formula:



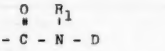
wherein
each of R_1 and R_2 is, independently, hydrogen, fluoro, chloro or alkyl of 1 to 3 carbon atoms, or are either both hydroxy or both an alkoxy of 1 to 3 carbon atoms; or one is hydrogen and the other bromo, hydroxy or alkoxy of 1 to 2 carbon atoms,
n is 1 to 3
R is alkyl of 1 to 5 carbon atoms,



X is a direct bond or $-(CH_2)_y-$
Y is 1 to 3;
m is 0 to 2,
each of Y and Y40 is, independently, hydrogen, fluoro, chloro or alkyl or 1 to 3 carbon atoms, or either both are hydroxy or both alkoxy of 1 or 2 carbon atoms; or one is hydrogen and the other bromo, hydroxy or alkoxy of 1 to 2 carbon atoms, provided that no more than two of R_1, R_2, Y and Y′ are hydroxy, further provided that neither of R_1 and R_2 is hydroxy with either of Y and Y′ is alkoxy and further provided that neither of Y and Y′ is hydroxy when either of R_1 and R_2 is alkoxy, and still further provided that one or both of R_1 and R_2 is fluoro or chloro or one is bromo or both are alkoxy or both hydroxy when R is alkyl and *n* is 1,
or a pharmaceutically acceptable acid addition salt thereof.

3,887,560
TONERS
Shinichiro Nagashima, and Terukuni Tuneda, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 722,274, April 18, 1968, abandoned. This application Dec. 30, 1971, Ser. No. 214,458
Claims priority, application Japan, Apr. 22, 1967, 42-25512
Int. Cl. C07d *51/80*
U.S. Cl. 260—267 **1 Claim**

1. An acid amido compound having the formula



wherein R is $CH_3(CH_2)_{12}-$, $CH_3(CH_2)_7CH{=}CH(CH_2)_7-$, $CH_3CH(CH_2)_{14}-$ or $H-C-(CH_2)_7CH_3$ / $H-C-(CH_2)_{11}-$,

R_1 is phenyl
and D is the non-amino portion of dye selected from the group consisting of nigrosine C.I. 50420.

3,887,561
PIPERIDINESULFONYLUREA DERIVATIVES
George R. Evanega, Ledyard; Donald E. Kuhla, Gales Ferry, and Reinhard Sarges, Mystic, all of Conn., assignors to Pfizer Inc., New York, N.Y.
Division of Ser. No. 305,594, Nov. 10, 1972, Pat. No. 3,829,434. This application Apr. 26, 1974, Ser. No. 464,332
Int. Cl. C07d *33/60*
U.S. Cl. 260—283 SA **8 Claims**

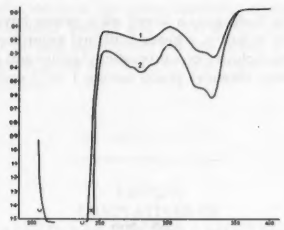
1. A sulfamylurea compound selected from the group consisting of 1-piperidinesulfonylureas of the formula:

and the base salts thereof with pharmacologically acceptable cations, wherein R is 8-quinolinyl, and R′ is a member selected from the group consisting of bicyclo[2.2.1]hept-5-en-2-yl-endo-methyl, bicyclo[2.2.1]hept-2-yl-endo-methyl, 7-oxabicyclo[2.2.1]hept-2-ylmethyl, 1-adamantyl and cycloalkyl having from five to eight carbon atoms.

3,887,562
SALT OF POLYMANNURONIC ACID AND DIHYDROQUINIDINE
Gonzalo Cobo Barrachina, Madrid, Spain, assignor to Laboratorios Berenguer Beneyto S.A., Madrid, Spain
Division of Ser. No. 144,044, May 17, 1971, abandoned. This application May 7, 1973, Ser. No. 357,702
Claims priority, application Germany, May 21, 1970, 2024847
Int. Cl. C07d *43/24*
U.S. Cl. 260—284 **1 Claim**

1. A dihydroquinidine salt of polymanuronic acid having the following properties:

a. a fine odorless powder of yellowish color and bitter taste,
b. stable in air at from ambient temperature to about 150°C,
c. empirical formula $(C_{26}H_{34}O_8N_2)_x$, wherein x is the number of monomer units of manuronic acid,
d. dihydroquinidine content of 60.46%,
e. infrared spectrum indicating a peak at 1,615 cm^{-1}, with a broad band at 1,710 cm^{-1},



f. insoluble in methanol, 96% ethanol, chloroform, cold propylene glycol and acetone, and soluble in 50% methanol, 50% ethanol and hot propylene glycol,
g. total decomposition at 190°C,
h. rotation of +77.3° (propylene glycol, $c = 0.5$),
i. ultraviolet spectrum indicating a maxima absorption at 280 and 333 nm and a minima absorption at 253 and 301 nm, and
j. carbon content of 58.18%, hydrogen content of 6.76% and nitrogen content of 5.22%.

3,887,563

NOVEL COMPOUNDS, SYNTHESES AND THE USES THEREOF

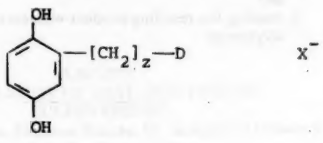
Stanley M. Bloom, Waban, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 102,931, Dec. 30, 1970, Pat. No. 3,797,937, which is a division of Ser. No. 741,293, July 1, 1968, Pat. No. 3,590,692. This application Oct. 31, 1973, Ser. No. 411,258

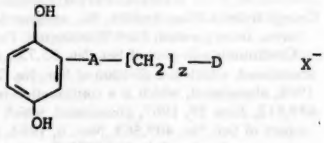
Int. Cl. C07d *33/32*

U.S. Cl. 260—286 R **7 Claims**

1. A compound selected from this represented by the formulae:



and



wherein z is an integer of from 2 to 10 inclusive, A is sulfur or oxygen, D is quinolinium or isoquinolinium and X is the anion of a salt.

3,887,564

ANTIBIOTIC A-25822 AND PROCESS FOR PRODUCTION THEROF

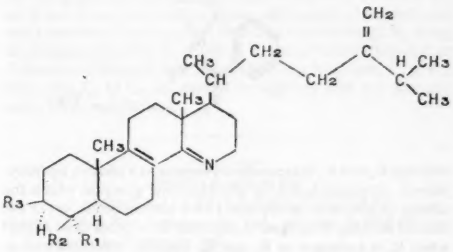
Robert H. Williams; Marvin M. Hoehn, and Karl-Heinz Michel, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 327,171, Feb. 2, 1973, Pat. No. 3,845,203, which is a continuation-in-part of Ser. No. 230,399, Feb. 29, 1972, abandoned. This application Mar. 21, 1974, Ser. No. 453,247

Int. Cl. C07d *33/48*

U.S. Cl. 260—287 R **6 Claims**

1. The antibiotic compound of the formula



wherein
R_1 and R_2 are both hydrogen or both methyl,
R_3 is hydroxy or acetoxy; or the non-toxic pharmaceutically acceptable acid addition salts thereof.

3,887,565

VINCADIOLINE

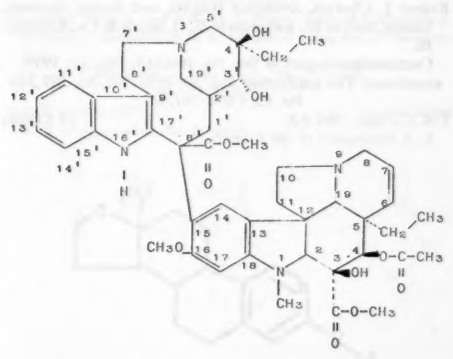
William E. Jones, Indianapolis, and George J. Cullinan, Trafalgar, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed May 6, 1974, Ser. No. 466,939

Int. Cl. C07d *33/50*

U.S. Cl. 260—287 R **3 Claims**

1. Vincadioline having the formula



and a pharmaceutically-acceptable acid addition salt, formed with a non-toxic acid.

3,887,566
2,3-DIHYDROIMIDAZO-ISOQUINOLINES

Ronald Ernest Rodway, Bourne End, and Ronald Frederick Cookson, Reading, both of England, assignors to Aspro Nicholas Ltd., Slough, England

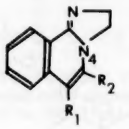
Filed Feb. 29, 1972, Ser. No. 230,464

Claims priority, application United Kingdom, Feb. 11, 1971, 4457/71

Int. Cl.[2] C07D *237/26*

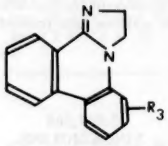
U.S. Cl. 260—288 R **6 Claims**

1. A 2,3-dihydroimidazo isoquinoline of formula VIa or a pharmaceutically acceptable acid addition salt thereof:



VIa

wherein R_1 and R_2 independently represent a phenyl, hydroxyphenyl, alkylthiophenyl, or alkoxyphenyl group in which the alkoxy or alkyothio group has 1 to 4 carbon atoms or, in the case of R_1 only, hydrogen except that R_1 is other than phenyl when R_2 is hydrogen or R_1 and R_2 together represent a divalent radical joined to the isoquinoline nucleus to form a 2,3-dihydroimidazo phenanthridine of formula:



wherein R_3 represents a halogen or hydrogen.

3,887,567
3-ALKOXY-2-AZAESTRATRIENES

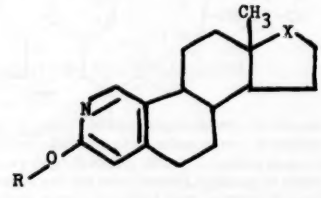
Robert J. Chorvat, Arlington Heights, and Pappo, Raphael, Skokie, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 100,419, Dec. 21, 1970, abandoned. This application Aug. 10, 1973, Ser. No. 387,389

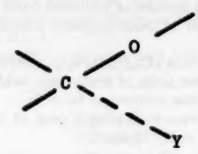
Int. Cl. C07d *101/00*

U.S. Cl. 260—289 AZ **11 Claims**

1. A compound of the formula



wherein R is a lower alkyl group having 1 to 7 carbon atoms inclusive or a cycloalkyl group having 4–8 carbon atoms inclusive, and X is a carbonyl group or a group of the formula



wherein Y is hydrogen, a lower alkyl group having 1 to 7 carbon atoms inclusive, a lower 1-alkynyl group having 2 to 7 carbon atoms inclusive or a propadienyl group and Z is hydrogen or a lower alkanoyl group having 1 to 7 carbon atoms inclusive.

3,887,568
PROCESS FOR PIPERIDINE DERIVATIVES

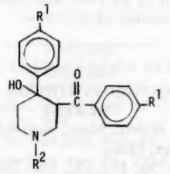
Charles M. Leir, Woodbury, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Filed July 12, 1973, Ser. No. 378,525

Int. Cl. C07d *29/20*

U.S. Cl. 260—293.8 **4 Claims**

1. A process for the preparation of compounds of the formula:



wherein R^1 is selected from fluorine, chlorine and hydrogen and R^2 is lower alkyl, and their pharmaceutically acceptable salts comprising

1. reacting benzene, chlorobenzene or fluorobenzene with a 3-halopropionyl halide in the presence of a Lewis acid and
2. treating the resulting product with excess aqueous lower alkylamine.

3,887,569
2-IMINO-PIPERIDINES

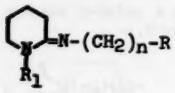
George Ireland Poos, Ambler, Pa., assignor to McNeil Laboratories, Incorporated, Fort Washington, Pa.

Continuation-in-part of Ser. No. 85,734, Oct. 30, 1970, abandoned, which is a division of Ser. No. 738,379, June 17, 1968, abandoned, which is a continuation-in-part of Ser. No. 649,812, June 29, 1967, abandoned, which is a continuation-n-part of Ser. No. 409,563, Nov. 6, 1964, abandoned. This application July 13, 1973, Ser. No. 379,030

Int. Cl. C07d *29/28*

U.S. Cl. 260—293.78 **3 Claims**

1. A chemical compound selected from the group consisting of a 2-aralkylimino-1-R_1-piperidine having the formula:



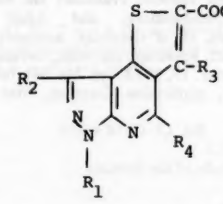
and the therapeutically active acid addition salts thereof, wherein n is the integer 1 or 2; R_1 is a member selected from the group consisting of loweralkyl and benzyl; and R is a member selected from the group consisting of phenyl, mono- and di-substituted phenyl and methylenedioxyphenyl, each substituent of said substituted phenyls being a member selected from the group consisting of halo, loweralkyl, loweralkoxy and hydroxy.

3,887,570
DERIVATIVES OF PYRAZOLO(3,4-B)THIENO(2,3-D)PYRIDINE-2-CARBOXYLIC ACIDS

Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sept. 28, 1973, Ser. No. 401,798
Int. Cl. C07d *31/50*
U.S. Cl. 260—294.8 B **10 Claims**

1. A compound of the formula



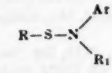
wherein R and R_2 each is hydrogen or lower alkyl;
R_1 is hydrogen, lower alkyl, phenyl, benzyl or phenethyl;
R_3 is lower alkyl, phenyl or substituted phenyl, wherein the phenyl substituent is lower alkyl, halo, trifluoromethyl, amino or carboxy; hydroxy or lower alkoxy; and
R_4 is hydrogen, lower alkyl or phenyl.

3,887,571
PREPARATION OF ARYL SUBSTITUTED SULFENAMIDES

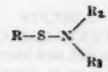
Marion J. Gattuso, Hoffman Estates, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 100,508, Dec. 21, 1970, abandoned, and Ser. No. 139,145, April 30, 1971, abandoned. This application Apr. 20, 1972, Ser. No. 246,043
Int. Cl. C07d *91/48*
U.S. Cl. 260—306.5 **2 Claims**

1. A process for preparing a compound of the formula

(I) 

which comprises the step of reacting a compound of the formula:

(II) 

with an arylamine acid addition salt in which the cation has the formula

Ar being phenyl, p-methoxyphenyl, alkylphenyl in which the alkyl has from 1 to 6 carbon atoms, dialkylphenyl in which the alkyl has from 1 to 6 carbon atoms, or aminophenyl, R, being Hydrogen, phenyl or C_1-C_2alkyl; R being 2-benzothiazolyl or 2-thiobenzothiazolyl; and R_2 and R_3 being hydrogen, C_1 to C_{10} alkyl and C_3 to C_{12} cycloalkyl or together with the nitrogen atom form morpholino.

3,887,572
PREPARATION OF 2-AMINO-5-ALKYL-1,3,4-THIADIAZOLES

Eddie Vi Ping Tao, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Sept. 21, 1973, Ser. No. 399,679
Int. Cl. C07d *91/62*
U.S. Cl. 260—306.8 D **8 Claims**

1. In a process for preparing an aminothiadiazole compound of the formula

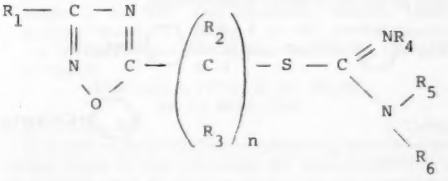
wherein R is C_1–C_7 alkyl and R^1 is hydrogen or C_1–C_6 alkyl, by reacting molar equivalents of an aliphatic acid and a 4-alkyl-3-thiosemicarbazide in a mineral acid medium, the improvement which comprises employing a mineral acid medium comprising 15 to 35 percent sulfuric acid and 65 to 85 percent polyphosphoric acid.

3,887,573
5-MERCAPTOALKYL-1,2,4-OXADIAZOLE DERIVATIVES

Hermann Breuer, and Uwe D. Treuner, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 5, 1973, Ser. No. 321,419
Int. Cl. C07d *85/52*
U.S. Cl. 260—307 G **9 Claims**

1. A compound of the formula



wherein R_1 is lower alkyl, phenyl, p-chlorophenyl, p-methoxyphenyl or phenyl-lower alkyl, R_2, R_3, R_4, R_5 and R_6 each is hydrogen or lower alkyl, and *n* is 1 or 2, said lower alkyl groups having less than four carbon atoms.

3,887,574

CARBOXAMIDO TETRAZOLO CHROMONES

Gwynn Pennant Ellis, Cardiff, and Mervyn Evan Peel, London, both of England, assignors to Allen & Hanburys Limited, London, England

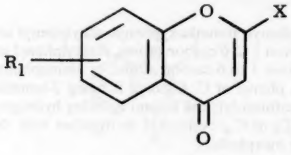
Filed Sept. 29, 1972, Ser. No. 293,578

Claims priority, application United Kingdom, Oct. 8, 1971, 46937/71

Int. Cl. C07d 55/56

U.S. Cl. 260—308 D 12 Claims

1. A compound having the formula



Wherein R_1 represents hydrogen, lower alky, lower alkoxy, hydroxy, cyano, nitro, carboxamidotetrazolyl, or tetrazolyl; and X is carboxamidotetrazolyl, or when R^1 is carboxamidotetrazolyl, X is tetrazolyl.

3,887,575

9H-DIBENZO[C, F]-S-TRIAZOLO[4,3-A]AZEPINES

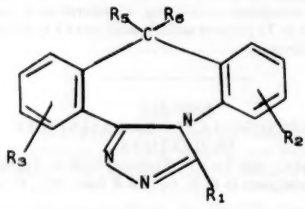
Jackson B. Hester, Jr., Galesburg, and Jacob Szmuszkovicz, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 313,208, Dec. 8, 1972, Pat. No. 3,850,942, which is a continuation-in-part of Ser. No. 227,916, Feb. 22, 1972, abandoned. This application Jan. 30, 1974, Ser. No. 437,818

Int. Cl. C07d 57/02, 57/04, 99/02

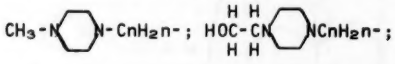
U.S. Cl. 260—308 R 16 Claims

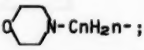
1. A compound selected from the group consisting of compounds of the formula III

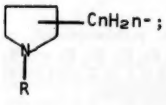


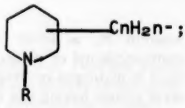
III

wherein R_5 and R_6 are each selected from the group consisting of hydrogen and alkyl of 1 to 3 carbon atoms, inclusive; wherein R_1 is selected from the group consisting of hydrogen, alkyl as defined as above, hydroxymethyl,

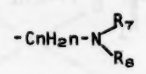








in which n is 1 to 4, inclusive, and R is hydrogen or alkyl defined as above, or R_1 is



in which n is defined as above, and R_7 and R_8 are each selected from the group consisting of hydrogen and alkyl as defined above, or

together is pyrrolidino or piperidino; wherein R_2 and R_3 are selected from the group consisting of hydrogen, fluoro, chloro, bromo, nitro, alkyl defined as above, trifluoromethyl, and alkoxy, in which the carbon moiety is of 1 to 3 carbon atoms, inclusive, and the pharmacologically acceptable acid addition salts.

3,887,576

SUBSTITUTED PHENYL-CARBAMOYL-ALKYL CARBONYLAMINO-BENZIMIDAZOLES

Gunther Dransch, Eschborn/Taunus; Kurt Hartel, Hofheim/-Taunus; Gerhard Horlein, Frankfurt am Main; Hubert Schonowsky, Neu-Isenburg, and Adolf Studeneer, Kelkheim/Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

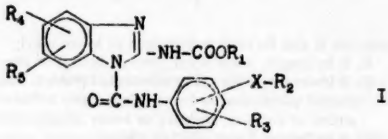
Filed Mar. 15, 1973, Ser. No. 341,760

Claims priority, application Germany, Mar. 21, 1972, 2213553

Int. Cl. C07d 49/38

U.S. Cl. 260—309.2 9 Claims

1. A benzimidazole of the formula



I

in which

R_1 is alkyl of 1 to 4 carbon atoms,

X is oxygen or sulfur,

R_2 is alkyl or alkenyl each of 1 to 4 carbon atoms, substituted by fluorine, chlorine or bromine, and each of R_3, R_4, R_5 represent hydrogen, fluorine, chlorine, bromine, or alkyl of 1 to 4 carbon atoms, and if R_4 and R_5 are different, mixtures thereof.

3,887,577

PROCESS FOR THE PREPARATION OF 2-IMINO DERIVATIVES OF SUBSTITUTED IMIDAZOLES

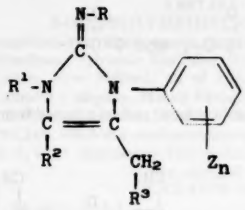
William D. Dixon, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed July 5, 1973, Ser. No. 376,493

Int. Cl. C07d 49/36

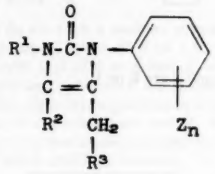
U.S. Cl. 260—309.6 11 Claims

1. A process for preparing a compound of the formula



· HCl

wherein: R is lower alkyl or lower alkoxy lower alkyl, R^1 is lower alkyl; R^2 is lower alkyl or hydrogen; R^3 is lower alkyl or hydrogen; Z is fluoro, chloro, bromo, lower alkyl, halo lower alkyl, or lower alkoxy and n is an integer zero through 2, which comprises reacting at temperatures from about 40°C. up to the reflux temperature of the system a 4-imidazolin-2-one of the formula



wherein R^1, R^2, R^3, Z and n are as defined above, with phosphorus oxychloride and a primary amine of the formula H_2N—R wherein R is as defined above.

3,887,578

1-AMINO-PYRAZOLIC DERIVATIVES

Giorgio Adembri; Piero Tedeschi; Fabio Ponticelli, and Maresco Marini, all of Florence, Italy, assignors to Etablissements Nativelle S.A., Paris, France

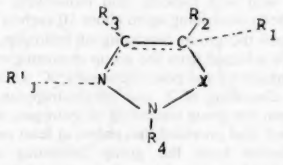
Filed Jan. 15, 1973, Ser. No. 323,605

Claims priority, application United Kingdom, Jan. 14, 1972, 1864/72; Jan. 14, 1972, 1866/72

Int. Cl. C07d *49/04*

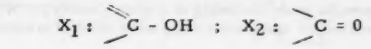
U.S. Cl. 260—310 A **5 Claims**

1. A 1-amino-pyrazole compound of the formula:



(I)

which X represents one of the two following forms:



wherein R_1 and R'_1, which cannot exist at the same time, represent a hydrogen atom or a lower alkyl group having 1 to 4 carbon atoms; R_2 and R_3, which may be identical or different represent a hydrogen atom, a lower alkyl group, a phenyl group, a phenyl group substituted by one or more groups selected from lower alkyl, halogen, nitro and lower alkoxy; R_4 represents an amino group, a mono-lower alkyl amino group or a di-lower alkyl amino group; or a pharmaceutically acceptable salt thereof with a mineral or organic acid.

3,887,579

METHOD OF MOLDING USING A POLYETHYLENE TEREPHTHALATE RELEASE FILM COATED WITH POLYETHYLENE SEBACATE

Jacques Brunet, Offranville, and Jean-Claude Rigaux, Rillieux, both of France, assignors to La Cellophane, Paris, France

Filed Apr. 9, 1973, Ser. No. 349,615

Claims priority, application France, Apr. 21, 1972, 72.14106

Int. Cl. B29c *1/04*

U.S. Cl. 264—316 **8 Claims**

1. The method of removing molded polymerized synthetic resin articles from a mold by placing at least one polyethylene terephthalate release film in the mold between the mold elements and at least one synthetic resin article to be polymerized in said mold, comprising:

a. coating said polyethylene terephthalate release film on at least one face thereof with a uniformly distributed coating of polyethylene sebacate having a density within the range of about 0.05 grams per square meter to about 5 grams per square meter;

b. placing at least one coated release film in the mold between the mold elements and at least one synthetic resin article prior to polymerization of such synthetic resin article in said mold, such that each synthetic resin article is only in contact with said polyethylene sebacate coating;

c. polymerizing each synthetic resin article in said mold;

d. cooling each molded polymerized synthetic resin article; and

e. removing each molded polymerized synthetic resin article from said mold and separating each release film from each molded polymerized synthetic resin article, said polyethylene sebacate coating being inert to said synthetic resin, and said polymerization step being carried out at a tempmerature which is lower than the melting point of said polyethylene terephthalate release film and said polyethylene sebacate coating.

3,887,580

METHOD OF CRYSTALLIZATION OF WATER IN SUPERCOOLED CLOUDS AND FOGS AND REAGENT USEFUL IN SAID METHOD

Veniamin Vasilievich Patrikeev, ulitsa Dmitria Ulyanova, 4, korpus 2, kv. 195; Anna Davydovna Malkina, Leningradskoe Shosse, 112, korpus 3, kv. 691, both of Moscow, and Amiran Ilich Kartsivadze, ulitsa Barnova, 64, Tbilisi, all of U.S.S.R.

Filed Sept. 8, 1972, Ser. No. 287,361

Int. Cl. B01d *17/00*

U.S. Cl. 252—319 **6 Claims**

1. A method for crystallizing or condensing water in supercooled clouds or fogs comprising the steps of subliming a crystallizing agent to form an aerosol of said crystallizing agent and introducing said aerosol into said supercooled clouds or fogs wherein the crystallizing agent is a sublimable metal chelate of acetoacetic ester or a β-diketone selected from the group consisting of acetylacetone, 3-chloroacetylacetone and acetoacetanilide with a metal se-

lected from the group consisting of copper, vanadium molybdenum and cobalt, said chelate being taken alone or in combination.

6. A reagent for use in crystallizing or condensing water in supercooled clouds and fogs, said reagent consisting of a mixture having the following composition in parts by weight:

copper acetylacetonate	25 – 50
copper chelate of acetoacetic ester	75 – 50.

3,887,581

PROCESS FOR PRODUCING IMINOISOINDOLINONE

Shoichi Kinoshita, Omiya; Masaji Oyama, Ogose, and Shunjiro Takijiri, Tokyo, all of Japan, assignors to Dainippon Ink & Chemicals Inc., Tokyo and Dainippon Ink Institute of Chemical Research, Saitama-ken, both of, Japan

Filed Oct. 17, 1972, Ser. No. 298,392
Claims priority, application Japan, Oct. 19, 1971, 46-82131
Int. Cl. C07d 27/50
U.S. Cl. 260—325 Ph 10 Claims

1. A process for producing 3-imino-, di-, tri-, or tetrahaloisoindoline-1-one metal salts which comprises reacting a di-, tri-, or tetra-halophthalonitrile in the presence of an alkali metal hydroxide, an alkaline earth metal hydroxide, or a compound forming such hydroxides by reaction with water, at a temperature of from 10 to 100°C for a time of from 0.5 to 40 hours.

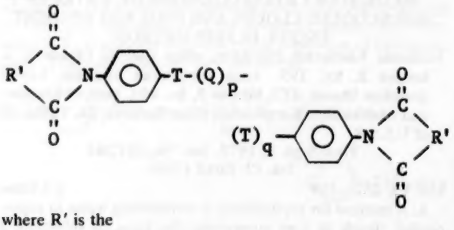
3,887,582

BIS-IMIDE COMPOSITIONS

Fred F. Holub, Schenectady, N.Y., and Carl M. Emerick, New Brighton, Pa., assignors to General Electric Company, Schenectady, N.Y.

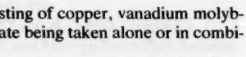
Continuation-in-part of Ser. No. 149,805, June 3, 1971, abandoned, which is a division of Ser. No. 819,430, April 25, 1969, Pat. No. 3,651,012. This application Sept. 20, 1973, Ser. No. 398,929
Int. Cl. C07d 27/18
U.S. Cl. 260—326.26 4 Claims

1. A composition of matter corresponding to the general formula

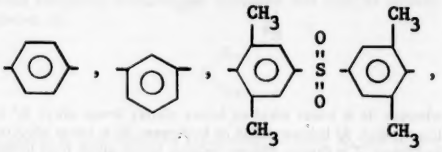


where R′ is the

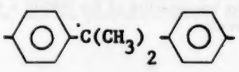
grouping, T is a member of the class consisting of



radicals, and Q is a divalent organic radical selected from the class consisting of



and



radicals, and p and q are 0 or 1.

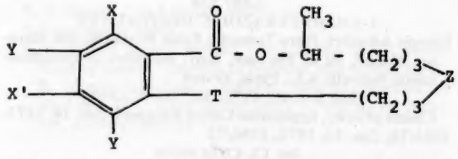
3,887,583

PRODUCTS AND PROCESS

Herbert L. Wehrmeister, Terre Haute, Ind.; David B. R. Johnston, Warren, and Thomas B. Windholz, Westfield, both of N.J., assignors to Commercial Solvents Corp., Terre Haute, Ind., by said Herbert L. Wehrmeister and Merck & Co., Inc., Rahway, N.J., by said David B. R. Johnston and Thomas B. Windholz

Continuation of Ser. No. 729,392, May 15, 1968, abandoned. This application Oct. 31, 1972, Ser. No. 302,414
Int. Cl. C07d 9/00
U.S. Cl. 260—343.2 F 40 Claims

1. A compound having the formula:



wherein T is a radical selected from the group consisting of —CH=CH— and —CH_2CH_2—; Z is > CH_2; R is selected from the group consisting of hydrogen, lower alkyl, lower acyclic carboxylic acid acyl radicals, and monocyclic carbocyclic aralkyl radicals containing up to about 10 carbon atoms; X is selected from the group consisting of hydrogen, —OR and —OR′; R′ is selected from the group consisting of benzoxazolyl, benzothiazolyl and phenyltetrazolyl; X′ is selected from the group consisting of X and tetrahydropyranyloxy; Y is selected from the group consisting of hydrogen, amino, nitro and hydroxyl, and provided that unless at least one of X and X′ is selected from the group consisting of tetrahydropyranyloxy, benzoxazolyloxy, benzothiazolyloxy, and phenyltetrazolyloxy, then at least one of X and X′ is hydrogen.

3,887,584

3-(HYDROXYMETHYL)CHROMONES

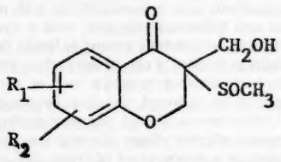
Maximilian Von Strandtmann, Rockaway; John Shavel, Jr., Mendham; Sylvester Klutchko, Hackettstown, and Marvin Cohen, New Milford, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 309,329, Nov. 30, 1972, Pat. No. 3,798,240, which is a continuation-in-part of Ser. No. 112,765, Feb. 4, 1971, abandoned. This application Dec. 26, 1973, Ser. No. 428,290

Int. Cl. C07d 7/34

U.S. Cl. 260—345.2 10 Claims

1. A compound of the formula:



wherein R_1 and R_2 are each a member selected from a group consisting of hydrogen, lower alkyl of 1 to 6 carbon atoms, halogen, carbocylic aryl of 6 to 8 carbon atoms, aryl lower alkyl in which aryl and lower alkyl are as defined, alkoxy of 1 to 6 carbon atoms, hydroxy, acylamino in which acyl is alkanoyl of less than 12 carbon atoms, and R_1 and R_2, when attached to adjacent carbon atoms, together form an orthofused arylene ring in which aryl is as defined.

3,887,585

POLYCYCLIC GAMMA-PYRONE-3-CARBOXALDEHYDE DERIVATIVES

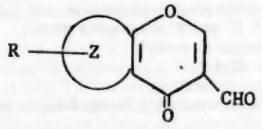
Daniel Kaminsky, deceased, late of Parsippany, N.J. (by Bernice R. Kaminsky, administratrix); Sylvester Klutchko, Hackettstown, and Maximilian Von Strandtmann, Rockaway, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 352,135, April 18, 1973, abandoned. This application June 19, 1974, Ser. No. 480,647

Int. Cl. C07d 7/32

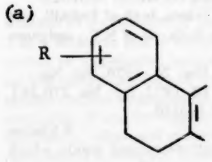
U.S. Cl. 260—345.2 13 Claims

1. A compound of the formula I:

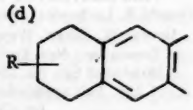


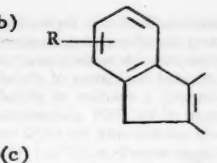
I

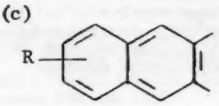
wherein R represents hydrogen, hydroxy, lower alkyl, or lower alkoxy and the Z ring has one of the following structures:



or







and the corresponding N-substituted, 3-formimide derivatives thereof.

3,887,586

ALLYL ETHERS

Madhukar Subraya Chodnekar, Basel; Albert Pfiffner, Pfaffhausen; Norbert Rigassi, Arlesheim; Ulrich Schwieter, Reinach, and Milos Suchy, Pfaffhausen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 108,599, Jan. 21, 1971, Pat. No. 3,781,309. This application Aug. 23, 1973, Ser. No. 390,962

Claims priority, application Switzerland, Jan. 27, 1970, 1104/70

Int. Cl. C07d 1/18

U.S. Cl. 260—348 R 1 Claim

1. 1-(Allyloxy)-4,5-epoxy-1,5-dimethylhexane.

3,887,587

SYNTHESIS OF PROSTAGLANDINS OF THE ONE-SERIES

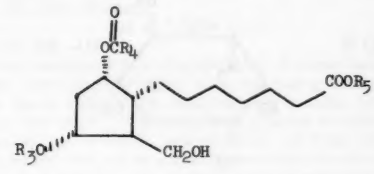
Thomas K. Schaaf, Old Lyme, Conn., and Elias J. Corey, Cambridge, Mass., assignors to Pfizer Inc., New York, N.Y.

Filed Apr. 17, 1972, Ser. No. 244,882

Int. Cl. C07d 5/32, 7/18; C07f 7/18

U.S. Cl. 260—345.8 2 Claims

1. A compound of the formula:



wherein

R_3 is tetrahydropyranyl, tetrahydrofuranyl, or dimethylisopropylsilyl; and

R_4 and R_5 are each alkyl of from 1 to 8 carbon atoms, phenylalkyl having up to three carbon atoms in the alkyl moiety, phenyl, tolyl, biphenyl, or fluorenyl.

3,887,588

PROCESS FOR MAKING NITROPHTHALIC ANHYDRIDES

Newell C. Cook, Schenectady, N.Y., and John M. Gasaway, Pittsfield, Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed May 8, 1974, Ser. No. 468,011

Int. Cl. C07c 63/14

U.S. Cl. 260—346.3 6 Claims

1. In the process for isolating a mixture of 3-nitrophthalic anhydride and 4-nitrophthalic anhydride from a solution of

the two anhydrides in concentrated sulfuric acid, the improvement which comprises extracting the aforesaid two nitrophthalic anhydrides using methylene chloride as the extractant.

2. The process for obtaining nitrated derivatives of phthalic anhydride which comprises forming a solution of phthalic anhydride in a solvent composed of 98–100% concentrated sulfuric acid, contacting the said solution with 98–100% concentrated nitric acid in temperature range from 85° to 110°C., and thereafter extracting the nitrated products with methylene chloride to obtain a mixture composed essentially of 3-nitrophthalic anhydride and 4-nitrophthalic anhydride.

3,887,589

2,5-DIETHYL-4-HYDROXY-2,3,-DIHYDROFURAN-3-ONE

Adolf Jan Eykelboom, Zevenaar, Netherlands, and Christiaan Herman Theodoor Tonsbeek, Orpington, England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 811,218, March 27, 1969, abandoned. This application May 23, 1972, Ser. No. 256,196

Claims priority, application Netherlands, Mar. 28, 1968, 6804336

Int. Cl. C07d *5/10*

U.S. Cl. 260—347.8 **1 Claim**

1. A compound having a flavor of caramel with the structure 2,5-diethyl-4-hydroxy-2,3-dihydrofuran-3-one.

3,887,590

AZIDO CYCLOHEXANEPENTOL DERIVATIVE

Andre Cier, Lyon; Stephan Gero, Ablon, and Alain Olesker, Marcoussis, all of France, assignors to Labaz, Paris, France

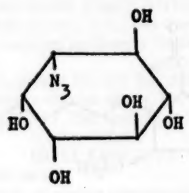
Filed July 30, 1973, Ser. No. 383,665

Claims priority, application United Kingdom, Aug. 16, 1972, 38300/72

Int. Cl. C07c *117/00*

U.S. Cl. 260—349 **1 Claim**

1. 1L-1-azido-1-deoxy-myo-inositol of the formula:



I

3,887,591

PROCESS FOR THE PRODUCTION OF 1-AMINO-4-NITROANTHRAQUINONE-2-CARBOXYLIC ESTERS

Wolfgang Elser, Frankenthal, and Gerd Schwantje, Ludwigshafen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen/Rhine, Germany

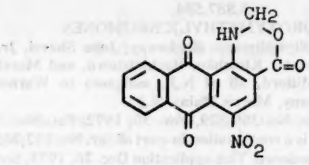
Filed Nov. 2, 1973, Ser. No. 412,421

Claims priority, application Germany, Nov. 9, 1972, 2254813

Int. Cl. C09b *1/22*

U.S. Cl. 260—376 **8 Claims**

1. A process for the production of esters of 1-amino-4-nitroanthraquinone-2-carboxylic acid which comprises reacting a compound of the formula



(I)

in the presence of a catalytic amount of an acid catalyst selected from the group consisting of sulfuric acid, hydrochloric acid, hydrobromic acid, dichloroacetic acid, trichloroacetic acid, benzenesulfonic acid, toluenesulfonic acid, naphthalene sulfonic acid and trifluoroacetic acid, with a cycloaliphatic alcohol of five to ten carbon atoms, a linear or branched saturated aliphatic alcohol of one to ten carbon atoms, or said saturated aliphatic alcohol in which one or two hydrogen atoms is replaced by hydroxyl, chlorine, bromine, alkoxy of one to four carbon atoms, phenyl, phenoxy or phenyl bearing chlorine, bromine, alkyl or alkoxy of one to four carbon atoms as a substituent at a temperature of from 100° to 180°C in excess of said alcohol or in an inert solvent.

3,887,592

2-HYDROXY OR ACETOXY SUBSTITUTED ESTERS USEFUL FOR THE CONTROL OF INSECTS

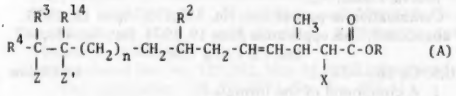
Clive A. Henrick, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 205,344, Dec. 6, 1971, Pat. No. 3,803,187. This application Jan. 14, 1974, Ser. No. 433,410

Int. Cl. C07c *69/62;* **A01n** *9/24*

U.S. Cl. 260—399 **8 Claims**

1. A compound selected from those of formula (A):



(A)

wherein,

n is zero or the positive integer one;

each of R^2, R^3 and R^4 is methyl or ethyl;

R^{14} is hydrogen or methyl;

R is lower alkyl;

X is hydroxy or acetoxy;

Z is hydrogen, lower alkyl, lower alkoxy or lower alkylthio; and

Z′ is hydrogen, or taken with Z, a carbon-carbon bond.

3,887,593

PREPARATION OF NITROKETONIZED AMIDES

Donald R. Lachowicz; George S. Saines, both of Fishkill, and George W. Eckert, Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.

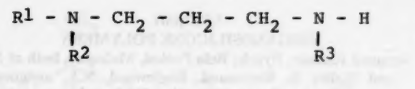
Division of Ser. No. 101,408, Dec. 24, 1970, Pat. No. 3,711,255. This application July 10, 1972, Ser. No. 270,362

Int. Cl. C07c *103/30*

U.S. Cl. 260—404.5 **8 Claims**

1. A method of preparing a nitroketonized amide which consists essentially of

contacting an acid amide of the formula:



where R^1 is an alkenyl group having from 4 to 40 carbon atoms, where R^2 and R^3 alternately represent hydrogen and an alkenoyl group having from 4 to 40 carbon atoms with dinitrogen tetroxide and oxygen at a temperature of from about −35° to 45°C., wherein the mole ratio of said acid amide to dinitrogen tetroxide to oxygen is from 1:2:2 to 1:4:60.

3,887,594
2-CHLORO AND ALKOXY OR ALKYLTHIO SUBSTITUTED ESTERS USEFUL FOR THE CONTROL OF INSECTS

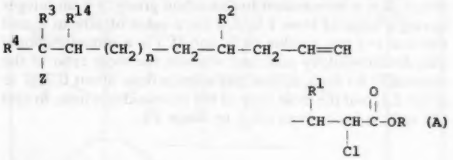
Clive A. Henrick, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 205,344, Dec. 6, 1971, Pat. No. 3,803,187. This application Jan. 14, 1974, Ser. No. 433,411

Int. Cl. C07c *69/62;* **A01n** *9/24*

U.S. Cl. 260—408 **6 Claims**

1. A compound selected from those of formula (A):



wherein,

n is zero or the positive integer one;

R^1 is methyl;

each of R^2, R^3 and R^4 is methyl or ethyl;

R^{14} is hydrogen or methyl;

R is lower alkyl; and

Z is lower alkoxy or lower alkylthio.

3,887,595
CARBONYLATION PROCESS

Kenzie Nozaki, St. Louis, Mo., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 5, 1973, Ser. No. 338,112

Int. Cl. C07c *51/14, 67/00*

U.S. Cl. 260—410.6 **8 Claims**

1. In the process of carbonylating olefinically unsaturated hydrocarbons of from 2 to 30 carbon atoms free from acetylenic unsaturation and conjugated olefinic unsaturation with carbon monoxide and with at least one hydroxylic compound selected from the group consisting of water, alkanol of from 1 to 20 carbon atoms, carboxylic acid of from 2–20 carbon atoms and mixtures thereof in the presence of a catalyst, the improvement which comprises producing predominately straight chain products by employing as said catalyst a composition consisting essentially of

a. a zerovalent noble metal phosphine complex of the general formula

$$(R_3P)_nM$$

wherein M is palladium or platinum, n is a whole number from 1 to 4 inclusive and R independently is a monovalent hydrocarbyl or substituted hydrocarbyl moiety of from 1 to 20 carbon atoms inclusive of substituents, is free from aliphatic carbon-carbon unsaturation and is selected from the group consisting of unsubstituted alkyl, unsubstituted phenyl, monosubstituted alkyl and monosubstituted phenyl wherein said substitutent is selected from the group consisting of alkoxy, carbalkoxy, trihalomethyl, halo, dialkylamino, alkanoyloxy and phenyl, in an amount of from about 0.0001 to about 0.1 mole percent of noble metal phosphine complex per mole of olefinic double bond present, and

b. from about 10 moles to about 150 moles of R_3P per mole of said noble metal-phosphine complex.

3,887,596
2-OXO SUBSTITUTED UNSATURATED ESTERS USEFUL FOR THE CONTROL OF INSECTS

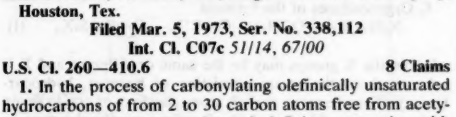
Clive A. Henrick, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 205,344, Dec. 6, 1971, Pat. No. 3,803,187. This application Jan. 14, 1974, Ser. No. 433,412

Int. Cl. C07c *69/62;* **A01n** *9/24*

U.S. Cl. 260—410.9 R **7 Claims**

1. A compound of the formula (IV):



wherein,

n is zero or the positive integer one;

R is methyl, ethyl or isopropyl;

each of R^2, R^3 and R^4 is methyl or ethyl;

R^{14} is hydrogen or methyl;

Z'' is hydrogen, lower alkyl, lower alkoxy or lower alkylsulfonyl; and

Z' is hydrogen or, taken with Z'' a carbon-carbon bond.

3,887,597
PROCESS FOR PRODUCING AN ORGANIC SILVER CARBOXYLATE

Kinji Ohkubo, and Takao Masuda, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 2, 1973, Ser. No. 356,560

Claims priority, application Japan, May 2, 1972, 47-43867; May 16, 1972, 47-48453

Int. Cl.² C08H *17/36*

U.S. Cl. 260—414 **18 Claims**

1. In a process of producing silver salt of a long chain aliphatic carboxylic acid which comprises mixing an aqueous silver nitrate solution or an aqueous silver complex solution with a solution of a carboxylic acid in a solvent in which said carboxylic acid is soluble, both said silver salt of the carboxylic acid and silver nitrate are almost insoluble and with which water is sparingly miscible, to react said carboxylic acid with silver ions, the improvement which comprises conducting said reaction of the carboxylic acid with silver ions in the presence of a mercury compound and/or lead compound.

3,887,598
PROCESS FOR THE MANUFACTURE OF METAL COMPLEXES IN A PURE FORM

Hans Eicke, Reinach; Vladimir Arnold, Basel, and Francois L'Eplattenier, Therwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

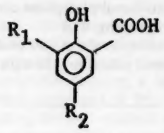
Filed Nov. 8, 1973, Ser. No. 413,994

Claims priority, application Switzerland, Nov. 22, 1972, 17009/72

Int. Cl. C07f *5/00, 5/06*

U.S. Cl. 260—429 R **4 Claims**

1. Process for the manufacture of metal complexes of trivalent or tetravalent metals with acids of the formula I



(I)

in which R_1 and R_2 independently of one another denote hydrogen, bromine, chlorine, alkyl, cycloalkyl or aralkyl, which is characterised in that a successive reaction is carried out, in a solvent, of

a. an acid of the formula I with

b. a salt of the formula II

$$M_pX_{(n-p)}/m \quad (II)$$

in which M denotes the cation of a trivalent or tetravalent metal, X denotes an anion which forms with M a salt which is soluble in the solvent of the process and p denotes 1, 2 or 3 and m corresponds to the valency of the anion X and n to the valency of the metal M and

c. an alcoholate of the formula III

$$M'OR \quad (III)$$

in which M′ denotes the cation of an alkali metal and R denotes lower alkyl, the methoxyethyl group or the ethoxyethyl group, a, b and c are employed in the molar ratio of (n-i):l/p:n, and i denotes 1 or 0 and, in the case that i is 1; the reaction mixture is reacted with water, the molar ratio of water to the acid of the formula I being at least 1:(n-1).

3,887,599

COMPLEXES CONTAINING SULPHUR

Grish Chandra, Penarth, Wales, assignor to Dow Corning Limited, Barry Glamorgan, Wales

Filed Oct. 29, 1973, Ser. No. 410,943

Int. Cl. C07f *15/00*

Claims priority, application United Kingdom, Nov. 11, 1972, 52202/72

U.S. Cl. 260—429 R **7 Claims**

1. Platinum (II) complexes represented by the formula

$$PtX_2(SR'R'')_2$$

in which X represents Cl, Br or I, R′ represents the R_3SiQ— group in which R represents an alkyl, aryl, aralkyl or alkaryl radical having from 1 to 18 inclusive carbon atoms and Q represents a divalent aliphatic hydrocarbon radical having from 1 to 6 carbon atoms inclusive and R″ represents an alkyl, aryl, aralkyl or alkaryl radical having from 1 to 18 inclusive carbon atoms or the R_3SiQ— group in which R and Q are as hereinabove defined.

3,887,600

BIMETALLIC SALTS AND DERIVATIVES THEREOF, THEIR PREPARATION AND USE IN THE COMPLEXING OF LIGANDS

Robert B. Long, Atlantic Highlands; Fred A. Caruso, Elizabeth, both of N.J.; Richard J. DeFeo, Baton Rouge, La., and David G. Walker, Baytown, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 805,912, Sept. 3, 1968, Pat. No. 3,651,159. This application May 17, 1971, Ser. No. 144,302

Int. Cl. C07f *1/08*

U.S. Cl. 260—438.1 **10 Claims**

1. A complex bimetallic salt having the generic formula $CuAlX_4L_m$ wherein X is selected from the group consisting of chlorine, bromine and flourine atoms, L is a complexible ligand [, said ligand selected from the group consisting of carbon monoxide, C_2-C_6 acetylenes,] C_2-C_{20} mono-olefins [,C_4-C_{10} conjugated diolefins, C_6-C_{16} polyolefins, C_5-C_{10} cyclic olefins and C_3-C_6 diolefins] and m is equal to the complexing stoichiometry of L and is an integer ranging from 1 to 4.

3,887,601

ORGANOSILICONE POLYMERS

Bernard Kanner, Nyack; Bela Prokai, Mahopac, both of N.Y., and Walter R. Rosemund, Englewood, N.J., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 293,415, Sept. 29, 1972, Pat. No. 3,796,676. This application July 26, 1973, Ser. No. 382,863

Int. Cl. C07f *7/08, 7/10, 7/18*

U.S. Cl. 260—448.2 B **26 Claims**

1. An organosilicone polymer which consists essentially of monomeric units (A), (B) and (C) wherein: (A) is $SiO_{4/2}$; (B) is a monofunctional siloxy unit having the unit formula,

$$E_e\text{-}SiO_{\frac{4-(e+f)}{2}}$$

wherein E is a poly(oxyalkylene) chain an oxygen atom of which is linked to silicon through a bivalent hydrocarbon radical, said chain being terminated at its other end by a monovalent organic radical selected from the group consisting of $R^{\infty}O$—, $R^{\infty}NHC(O)O$— and $R^{\infty}C(O)O$— where R^{∞} is a monovalent hydrocarbon group having from 1 to 12 carbon atoms, R is a monovalent hydrocarbon group, e is an integer having a value of from 1 to 3, f has a value of zero to 2, and the sum $e+f$ has a value of 3; and (C) is a monofunctional trihydrocarbylsiloxy unit; and wherein the mole ratio of the aforesaid (A) units to said (B) units is from about 0.75:1 to about 2:1, and the mole ratio of the aforesaid (C) units to said (B) units is from about 0.1:1 to about 1:1.

3,887,602

PREPARATION OF NEW ORGANOSILANES

Friedrich Martin Thurn, Bruhl; Eugen Meyer-Simon, Frankfurt; Werner Will, Wolfgang; Franz Schmidt, Mannheim; Wolfgang Schenk, Schwetzingen, and Rolf Wurmb, Heidelberg, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed Dec. 19, 1973, Ser. No. 426,028

Int. Cl. C07f *7/08, 7/18*

Claims priority, application Germany, Dec. 22, 1972, 2262909

U.S. Cl. 260—448.2 B **3 Claims**

1. Organosilanes of the formula

$$X_3Si\text{—}R\text{—}[(OCH_2)_n\text{—}O\text{—}R']_m\text{—}O\text{—}R\text{—}SiX_3 \quad (I)$$

wherein the X groups may be the same or different and X is selected from the group consisting of halogen, hydrocarbonoxy of one to seven carbon atoms, acyloxy of one to seven carbon atoms and hydroxyl; the R groups may be the same or different and R is a straight chain or branched bivalent hydrocarbon fragment of two to 10 carbon atoms which is connected to the silicon atom by a silicon-carbon bond and may be interrupted one or more times by an oxygen atom; R′ is an alkylene group of two to six carbon atoms which may contain one or two oxygen bridges; n is a number from 1.0 to 5.0; and m is a number from about 10 to 200.

3,887,603

MENTHOL-RELEASE COMPOUNDS

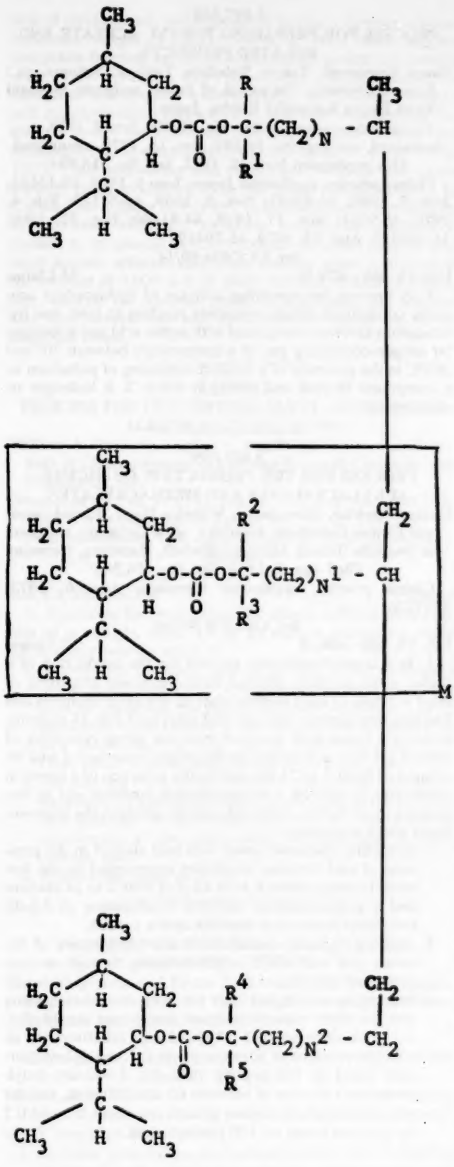
Eric G. S. Rundberg, Jr.; William R. Johnson, Jr., and Harvey J. Grubbs, all of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed July 30, 1973, Ser. No. 384,048

Int. Cl. C08g *17/13;* **A24b** *3/12, 13/00*

U.S. Cl. 260—463 **9 Claims**

1. A compound having the chemical formula:



wherein:

N, N^2 and each N^1 have values of from 0 to 8; R, R^1, R^4, R^5 and each R^2 and R^3 are each selected from the group consisting of alkyl having from 1 to 6 carbons, cycloalkyl having from 5 to 10 carbons and aromatic carbocyclic having from 6 to 10 carbons; and M has a value of from 0 to 98.

3,887,604

2-(2-HYDROXYETHYLAMINO)BENZOPHENONE OXIMES

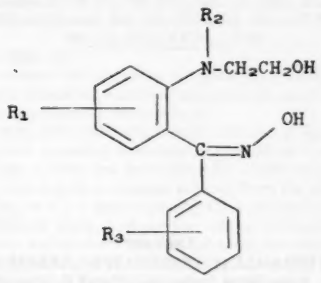
Giles Allen Archer, Montclair, and Leo Henryk Sternbach, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 175,738, Aug. 27, 1971, Pat. No. 3,803,233, which is a division of Ser. No. 819,410, April 25, 1968, Pat. No. 3,646,011, which is a continuation-in-part of Ser. No. 763,004, Sept. 26, 1968, Pat. No. 3,583,978. This application Dec. 19, 1973, Ser. No. 426,421

Int. Cl. C07c *131/00*

U.S. Cl. 260—465 D **1 Claim**

1. Compounds of the formula



wherein R_1 and R_3 each are selected from the group consisting of hydrogen, halogen, trifluoromethyl, nitro, amino, lower alkanoyl-amino, lower alkylthio, lower alkyl sulfonyl, lower alkylsulfinyl, lower alkoxy, hydroxy, lower alkyl, cyano, carboxy, carbo-lower alkoxy, carbamyl, and di-lower alkylamine; and R_2 is selected from the group consisting of hydrogen, lower alkyl, lower alkenyl and lower alkanoyl.

3,887,605

PROCESS FOR RECOVERY OF 2,6-DICYANONAPHTHALENE

Richard V. Norton, Wilmington, Del., and Howard P. Angstadt, Media, Pa., assignors to Sun Ventures, Inc., St. Davids, Pa.

Filed Jan. 10, 1974, Ser. No. 432,369

Int. Cl. C07c *121/62*

U.S. Cl. 260—465 C **2 Claims**

1. In the process of separating 2,6-dicyanonaphthalene from a gaseous ammoxidation product stream, the improvement which comprises cooling said hot product stream to a temperature above 240°C. and below about 300°C. and separating condensed solid crystals of 2,6-dicyanonaphthalene.

3,887,606

PROCESS FOR THE PREPARATION OF DL-PHENYLGLYCINE ESTERS

Gordon Hanley Phillipps, Wembley; Leslie Stephenson, Hanwell; Albert Roy Cooksey, Torver, and John Colin Clark, Gerrards Cross, all of England, assignors to Glaxo Laboratories Limited, Greenford, Middlesex, England

Filed June 2, 1972, Ser. No. 259,298

Claims priority, application United Kingdom, June 2, 1971, 18675/71

Int. Cl. C07c *101/06*

U.S. Cl. 260—471 A **18 Claims**

1. A process for the resolution of a DL-phenylglycine ester of the formula:

$$C_6H_5CH{\cdot}NH_2{\cdot}CO_2R$$

where R represents an alkyl group with 1 to 6 carbon atoms or a cycloalkyl group withh 5 or 6 carbon atoms, which com-

prises treating said DL-phenylglycine ester with (+)-tartaric acid at a temperature of from 15° to 60°C in the presence of a mixture of solvents of different polarities one of which is an alkanol having 1–4 carbon atoms, the said (+)-tartaric acid being used in a stoichiometric amount or in an excess up to 100 percent, and selectively crystallising the (+)-hemitartrate of the D-phenylglycine ester therefrom at a temperature of from −20° to +60°C.

3,887,607

A TETRA-ALLYL TERMINATED CARBAMATE

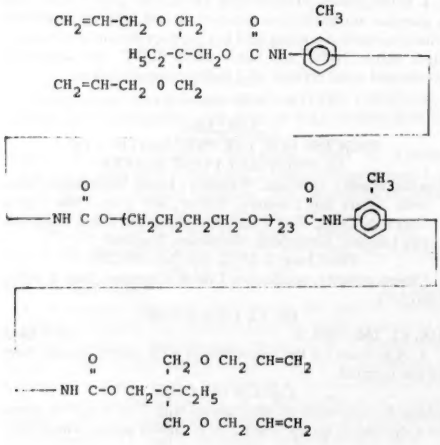
Clifton L. Kehr, Silver Spring, and Walter R. Wszolek, Sykesville, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 617,801, Feb. 23, 1967, abandoned, which is a continuation-in-part of Ser. No. 567,841, July 26, 1966, abandoned. This application May 26, 1970, Ser. No. 40,738

Int. Cl. C07c *125/06*

U.S. Cl. 260—471 C **1 Claim**

1. A terminally unsaturated polyene component having the formula:



3,887,608

PROCESS FOR PREPARING PHENYL ACETATE AND RELATED PRODUCTS

Naoya Kominami, Tokyo; Nobuhiro Tamura, Saitama, and Etsuo Yamamoto, Tokyo, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 42,903, June 2, 1970, abandoned, and Ser. No. 98,889, Dec. 16, 1970, abandoned. This application Nov. 30, 1972, Ser. No. 310,894

Claims priority, application Japan, June 9, 1969, 44-44644; June 9, 1969, 44-44645; Nov. 5, 1969, 44-88113; Feb. 4, 1970, 45-9304; Nov. 17, 1969, 44-91460; Dec. 27, 1969, 44-104827; Aug. 13, 1970, 45-70419

Int. Cl. C07c *69/14*

U.S. Cl. 260—479 R **25 Claims**

1. A process for preparing acetates of hydrocarbon aromatic compounds which comprises reacting at least one hydrocarbon aromatic compound with acetic acid and a molecular oxygen-containing gas, at a temperature between 30° and 300°C in the presence of a catalyst consisting of palladium or a compound thereof and XNO_3 in which X is hydrogen or alkali metal.

3,887,609

PROCESS FOR THE PRODUCTION OF HIGHER ALKYLACRYLATES AND METHACRYLATES

Gunter Strehlke, Rheinkamp; Wilhelm Franz, Rheinhausen, and Gunter Osterburg, Homberg, all of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Filed Apr. 1, 1974, Ser. No. 456,584

Claims priority, application Germany, Apr. 6, 1973, 2317226

Int. Cl. C07c *69/54*

U.S. Cl. 260—486 R **7 Claims**

1. In a transesterification process for the production of a higher ester member selected from the group consisting of alkyl acrylate or alkyl methacrylate of low color numbers and low impurity content wherein said alkyl is of 3 to 24 carbons, wherein a lower ester selected from the group consisting of methyl acrylate and methyl methacrylate is contacted with an alkanol of from 3 to 24 carbons in the presence of a titanium alcoholate as catalyst, a polymerization inhibitor and an entraining agent for the methyl alcohol by-product, the improvement which comprises:

a contacting said lower ester with said alkanol in the presence of said titanium alcoholate represented by the formula $Ti(OR)_4$ where R is an alkyl of from 2 to 24 carbons and a polymerization inhibitor combination of 2,6-di-tert.-butyl-para-cresol and adsorptive carbon,

b. carrying out said esterification at a temperature of between 100° and 150°C. while bubbling through an oxygen-containing gas,

c. recovering said higher ester member, in said contacting step the initial mole ratio of said lower ester to said alkanol of between about 2 : 1 and 1.1 : 1, the titanium alcoholate content of between about 0.1 and 1.0 wt. percent based on 100 percent yield, the 2,6-di-tert.-butyl-para-cresol content of between 60 and 200 ppm, and the adsorptive carbon content of between about 0.1 and 0.2 wt. percent based on 100 percent yield.

3,887,610

EMULSION POLYMERIZATION OF ETHYLENE WITH CHAIN TRANSFER AGENTS TO FORM COPOLYMERS

Alfred E. Kober, Daytona Beach, Fla., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Dec. 9, 1971, Ser. No. 206,505

Int. Cl. C07c *69/12*

U.S. Cl. 260—491 **5 Claims**

1. An emulsion polymerization process for preparing an oi soluble copolymer useful for improving the flow properties o petroleum fuel oils, said copolymer consisting essentially o about 4 to 15 molar proportions of ethylene per molar propor

tion of vinyl acetate, said copolymer having a number average molecular weight of about 3500 to 15,000, which process comprises forming an aqueous emulsified system comprising water, vinyl acetate, a water soluble free radical initiator, an emulsifier and a chain transfer agent, introducing ethylene and copolymerizing said ethylene and said vinyl acetate for about 6 to 600 minutes under ethylene pressure of 50 to 500 atomospheres, at a temperature in the range of about 60° to 120°C., and recovering said copolymer, wherein said chain transfer agent is selected from the group consisting of C_1 to C_{18} alkyl mercaptan and C_1 to C_4 chloroalkanes containing up to 4 chlorine atoms per molecule, wherein said initiator is present in an amount of 0.001 to 0.05 mole per mole of said vinyl acetate, wherein said chain transfer agent is present in the amount of 0.005 to 0.25 mole per mole of said vinyl acetate, wherein the aqueous phase is continuous, and wherein said vinyl acetate and said chain transfer agents are in the dispersed phase.

3,887,611
PROCESS FOR CONVERTING ALKYL SULTONES TO ALKENE SULFONIC ACIDS

William A. Sweeney, Larkspur, and Ralph House, San Pablo, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 215,191, Jan. 3, 1972, Pat. No. 3,845,114, which is a continuation-in-part of Ser. No. 33,948, May 1, 1970, abandoned. This application Aug. 2, 1973, Ser. No. 384,862

Int. Cl. C07c *143/16*

U.S. Cl. 260—513 R **7 Claims**

1. A process for maximizing the alkene sulfonic acid content of a straight chain 10 to 24 carbon sulfonated olefin which comprises the steps of

a. hydrolyzing the alkyl sultone present in the sulfonated olefin to alkenesulfonic acid and hydroxyalkanesulfonic acid by contacting the sulfonated olefin with from 5 to 25 percent of water relative to the weight of the alkyl sultone at a temperature of from 100° to 200°C for a period of from about one-half hour to about 20 hours, and

b. dehydrating the product of (a) to convert the hydroxyalkanesulfonic acid produced in (a) by heating the product and distilling off the water produced by the resulting dehydration of the hydroxyalkyl sulfonic acid to alkyl sultone, and

c. hydrolyzing again as in (a).

3,887,612
PROCESS FOR PREPARING HIGH PURITY TEREPHTHALIC ACID

Motoo Shigeyasu, and Kenzo Kuihara, Ehime, both of Japan, assignors to Maruzen Oil Co., Ltd. and Matsuyama Petrochemicals Inc., Osaka, both of, Japan

Filed Apr. 26, 1972, Ser. No. 247,711

Claims priority, application Japan, Apr. 26, 1971, 46-27359

Int. Cl. C07c *63/26*

U.S. Cl. 260—524 R **25 Claims**

1. A process for producing terephthalic acid of high purity which comprises the steps of:

a. oxidizing para-xylene in the liquid phase with molecular oxygen or a gas containing molecular oxygen in the presence of a lower aliphatic carboxylic acid as a solvent and an oxidation catalyst, and subjecting the resulting product which comprises crude terephthalic acid particles in a mother liquor comprising unreacted components and reaction by-products of the reaction to a solid-liquid separation, thereby separating crude terephthalic acid particles from said mother liquor;

b. feeding the crude terephthalic acid particles into a slurrying tank and slurrying it by addition of fresh solvent;

c. stirring the resulting slurry by continuously withdrawing a part of it from the slurrying tank and returning it into the slurry portion in said slurrying tank through a circulating pump located outside the slurrying tank to thereby reduce the average particle size of the terephthalic acid by crystal/crystal contact during said stirring; and

d. subsequently feeding the slurry into an immersion tank, immersing the slurry therein at an elevated temperature while maintaining the solvent in the liquid state, and thereafter subjecting it to solid-liquid separation to form purified terephthalic acid.

3,887,613
THERMAL PURIFICATION OF TEREPHTHALIC ACID USING GROUP I-B, II-B, VIII CATALYSTS

Jorge A. Blay, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 705,616, Feb. 15, 1968, abandoned. This application July 30, 1971, Ser. No. 167,857

Int. Cl. C07c *63/26*, *51/42*

U.S. Cl. 260—525 **3 Claims**

1. A method for improving the purity of a crude terephthalic acid containing 4-carboxybenzaldehyde as an impurity, which process consists essentially of

1. heating said crude terephthalic acid and an inert liquid medium consisting essentially of from about 0 – 75% by weight of water and from about 25 – 100% by weight of an inert organic compound selected from the group consisting of C_5 + hydrocarbons, C_2 + halohydrocarbons, carboxylic acids, hydrocarbon ethers, halohydrocarbon ethers, and mixtures thereof, and a soluble catalyst which will provide a metal selected from Group I-B, or II-B of Mendelyeev's Periodic Table to a temperature of at least 325°C, said temperature being one at which no more than about 50% of the terephthalic acid remains as a solid, the pressure being sufficient to maintain a liquid phase at temperatures below the critical temperature, said catalyst being present in an amount sufficient to provide from about 100 ppm to 6% by weight of terephthalic acid and liquid medium,
2. cooling the terephthalic acid and liquid medium so as to crystallize terephthalic acid and
3. recovering the thus crystallized, purified terephthalic acid.

3,887,614
DETERGENT COMPOSED OF HOLLOW SPHERICAL PELLETS, AND PROCESS FOR MANUFACTURING THE SAME

Rinnosuke Susuki, Tokyo; Hiroshi Hoshi, Chiba-ken; Mineru Yoshida, Tokyo; Toshisaburo Toyoda, Chiba-ken; Masayoshi Nakamura, Tokyo, and Susumu Ando, Chiba-ken, all of Japan, assignors to Raion Yush Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 94,420, Dec. 2, 1970, abandoned. This application June 21, 1973, Ser. No. 371,987

Claims priority, application Japan, Dec. 3, 1969, 44-97293

Int. Cl. C11d *3/08*, *11/00*, *13/20*

U.S. Cl. 252—531 **7 Claims**

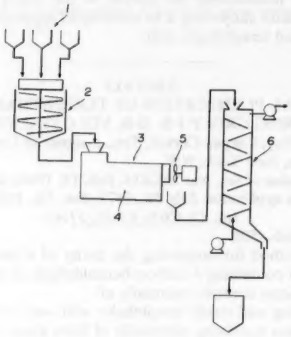
1. A process for manufacturing a detergent composed of hollow spherical pellets comprising the steps of mixing and kneading

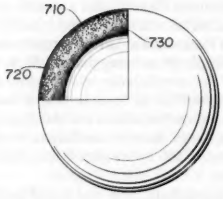
a. 40 – 75 percent by weight of a matrix consisting of 30 – 50 percent by weight of sodium silicate ($Na_2O : SiO_2 = 1 : 2.1 – 3.1$), 15 – 30 percent by weight of a surface active agent selected from the group of organic sulfate esters and organic sulfonates, and 30 – 50 percent by weight of water, with

b. 25 – 60 percent by weight of a dispersoid material consisting substantially of inorganic builders into the form of a detergent composition having plasticity;

extruding said kneaded plastic composition through bores at a temperature of 40° to 80°C. and cutting into damp pellets having a diameter from 0.6 to 3.0 mm, and thermally drying and foaming said pellets to form said hollow spherical pellets, said drying and foaming being carried out by subjecting the

pellets to a hot blast having a temperature up to 400°C. to heat said pellets to between 150° and 300°C. while rolling said pellets downward for a period of time sufficient to produce





hollow spherical pellets 1 to 5 mm in diameter with a shell thickness 2 to 50 percent of the radius thereof and having an apparent specific gravity between 0.1 and 0.4.

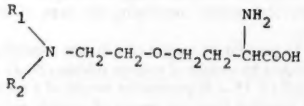
3,887,615

NOVEL BUTANOIC ACID DERIVATIVES

Dennis Keith, Montclair, and Manfred Weigele, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 3, 1974, Ser. No. 457,340
Int. Cl. C07c *101/12*
U.S. Cl. 260—534 M **3 Claims**

1. A compound of the formula



wherein R_1 and R_2 each independently represent hydrogen or lower alkyl, or R_1 and R_2 taken together with their attached nitrogen atom form a 5- or 6-membered saturated heterocyclic ring wherein said 6-membered ring may contain an additional nitrogen atom or an oxygen atom; provided that one of R_1 or R_2 is other than hydrogen

the pharmaceutically acceptable addition salts thereof, and the optical antipodes thereof.

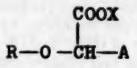
3,887,616

HYDROXY ETHER CARBOXYLATES

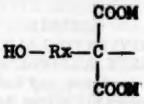
Kent P. Launert, Freeburg, Ill., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 19, 1973, Ser. No. 426,158
Int. Cl. C07c *59/12*
U.S. Cl. 260—535 P **5 Claims**

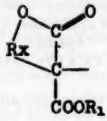
1. Compounds represented by the formula



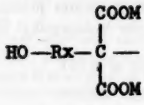
wherein R is selected from the group consisting of



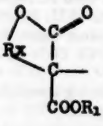
and



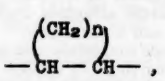
A is selected from the group consisting of hydrogen, methyl and ethyl; M is selected from the group consisting of alkali metal, ammonium, alkyl ammonium containing one to four carbon atoms and alkanol ammonium containing one to four carbon atoms; X is M when R is



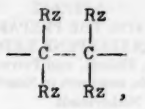
and X is hydrogen or an alkyl group containing from one to 20 carbon atoms when R is



R_1 is selected from the group consisting of hydrogen and alkyl groups containing from one to 20 carbon atoms; and Rx is selected from the group consisting of



n being an integer from 4 to 10, and



Rz being selected from the group consisting of hydrogen, alkyl, phenyl, phenyl alkyl, alkoxy alkyl, alkoxy phenyl, alkoxy phenyl alkyl and COOX, the total number of carbon atoms in Rx being from two to 22.

3,887,617

PRODUCTION OF 2-PHENYL-3-NITROBUTYRIC ACID COMPOUNDS

Dieter Seebach, Lich, and Herbert Leitz, Karlsruhe, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

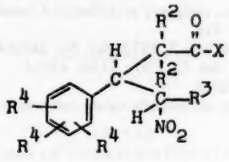
Filed June 26, 1972, Ser. No. 266,432

Claims priority, application Germany, July 9, 1971, 2134419

Int. Cl. C07c *103/02, 67/04*

U.S. Cl. 260—559 R **9 Claims**

1. A process for the production of a 2-phenyl-3-nitrobutyric acid compound of the formula:

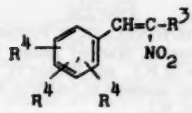


(I)

in which X is the radical

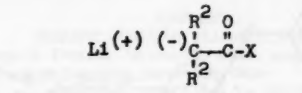
or the radical —OR¹, the individual radicals R¹, R² and R⁴ may be identical or different and each may be an aliphatic, araliphatic, cycloaliphatic or aromatic radical, R³ is hydrogen or an aliphatic radical, and each of the radicals R⁴ may also be hydrogen, halogen, nitro, or —OR¹ in which R¹ has the meanings given above, each of the radicals R² may also be hydrogen, and the two radicals R¹ in the radical

may also form together with the adjacent nitrogen atom a heterocyclic ring, wherein a 1-phenyl-2-nitroethene of the formula:



(II)

in which R³ and R⁴ have the meanings given above is reacted at a temperature within the range from −120° to +25°C with a lithium compound of the formula:



(III)

in which X and R² have the meanings given above, an acid or a proton-donating acid salt is added to the reaction mixture in an amount sufficient to convert the end product (I) in the form of its lithium compound to said end product (I), and the end product (I) is isolated from the reaction mixture.

3,887,618

USE OF WEAK BASE RESINS AS CATALYSTS FOR THE METHYLOLATION OF ACRYLAMIDE

Delton William Hein, Darien, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Feb. 28, 1974, Ser. No. 446,980

Int. Cl. C07c *103/60*

U.S. Cl. 260—561 N **10 Claims**

1. A continuous process for preparing a methylolacrylamide which comprises: admixing a solution of an acrylamide dissolved in an aqueous formaldehyde menstruum at a pH ranging from 6.5 – 7.5, preheating said solution at a temperatute ranging from 40°C. to 75°C., passing said preheated solution through a column packed with a weakly basic, ion-exchange resin maintained at a temperature between 40°C. and 75°C., said solution being passed through at a residence time of from one to five minutes, and recovering a N-methlolacrylamide in good yield and purity.

3,887,619

N-HYDROCARBYLSULFENYL-N-ALKYL-N'-ARYLFORMAMIDINES

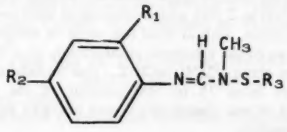
Victor L. Rizzo, Almena, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed June 1, 1973, Ser. No. 366,999

Int. Cl. C07c *123/00*

U.S. Cl. 260—564 RF **17 Claims**

1. A compound selected from those of the formula:



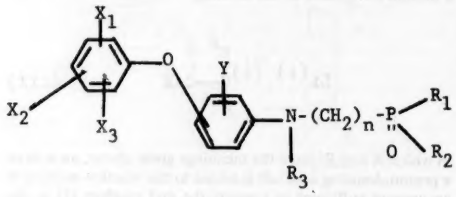
or a salt thereof with an acid selected from the group consisting of hydrobromic acid, sulfuric acid, phosphoric acid, acetic acid, lactic acid, citric acid, succinic acid, benzoic acid and salicylic acid wherein R_1 is lower alkyl, R_2 is selected from hydrogen, halogen and lower alkyl and R_3 is selected from lower alkyl, phenyl, halogensubstituted phenyl, lower alkyl-substituted phenyl, lower alkoxy-substituted phenyl and halogen-substituted lower alkyl.

3,887,620
N-DIALKYLPHOSPHINYLALKYL PHENOXYANILINES

Edward J. Glamkowski, Warren; Joseph T. Strupczewski, Piscataway, both of N.J., and Erhard H. Wolf, Hofheim/-Taunus, Germany, assignors to American Hoechst Corporation, Bridgewater, N.J.

Filed June 5, 1973, Ser. No. 367,108
Int. Cl. C07c *93/14*, *103/10*, *103/30*
U.S. Cl. 260—571 8 Claims

1. A compound of the formula



wherein

R_1 and R_2 are alkyl of 1 to 4 carbon atoms,

n is an integer from 1 to 4,

R_3 is hydrogen, or aralkyl of 7 or 8 carbon atoms,

X_1, X_2 and X_3 are hydrogen, halogen, trifluoromethyl, phenyl, alkyl of 1 to 4 carbon atoms, cyclohexyl, alkoxy of 1 to 4 carbon atoms, or dialkylamino of 1 to 4 carbon atoms in each alkyl group, and Y is hydrogen, methyl or chloro, and the pharmaceutically acceptable salts thereof.

3,887,621
MODIFIED POLYMERS AS PETROLEUM ADDITIVES

Perry Polss, Wilmington, Del., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.

Filed Apr. 9, 1973, Ser. No. 349,304
Int. Cl. C07c *87/04*
U.S. Cl. 260—583 R 10 Claims

1. A hydrocarbon fuel-soluble reaction product prepared by the process of

i. reacting an olefin polymer, selected from C_3, C_4 and C_3/C_4 olefin polymers having a molecular weight in the range of about 500 to 2,500, and containing at least one ethylenic unsaturation, with at least one mole of nitrosyl chloride per mole of the ethylenic unsaturation, at a temperature of from about −25°C. to 50°C., and introducing into the polymer from 75 to 100 percent of the theoretical amount of one chemically bound nitrogen per ethylenic unsaturation;

ii. heating the product of (i) at about 60°C. to 100°C. until it is free of substantially all unreacted nitrosyl chloride; and

iii. reacting the product of (ii) with an aliphatic hydrocarbon primary or secondary amine having about 4 to 20 carbon atoms, at a temperature of about 60°C. to 100°C., the amine being used at about the molar equivalent of ethylenic unsaturation in the olefin polymer reactant of (i), until cessation of water evolution.

3,887,622
PROCESS FOR THE PREPARATION OF SESQUITERPENE KETONES

Harmannus Boelens, Huizen, and Petrus C. Traas, Naarden, both of Netherlands, assignors to Naarden International NV, Naarden-Bussum, Netherlands

Filed July 17, 1973, Ser. No. 380,054
Claims priority, application United Kingdom, July 20, 1972, 33960/72
Int. Cl. C07c *45/04*
U.S. Cl. 260—586 P 3 Claims

1. A process for the preparation of sesquiterpene ketones comprising reacting at a temperature of 40° to 100°C. for a period of 6 to 12 hours 1 mol of sesquiterpene hydrocarbon having one olefinic linkage in an endocyclic position selected from the group consisting cedrene, isolongifolene and thuyopsene with 1.3 – 1.5 mols of hydrogen peroxide, having a concentration of from 20 –50% by weight in the presence of from 120 –200 mol % of a lower alkyl formate.

3,887,623
METHOD FOR PREPARING DIVINYL SULPHIDE

Boris Alexandrovich Trofimov, ulitsa Lermontova, 321a, kv. 32, and Svetlana Viktorovna Amosova, ulitsa Dekabrskikh sobyty, 105 "B", kv. 43, both of Irkutsk, U.S.S.R.

Filed Jan. 2, 1973, Ser. No. 321,055
Int. Cl. C07c *149/10*
U.S. Cl. 260—609 B 9 Claims

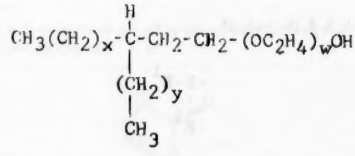
1. A method for preparing divinyl sulphide, consisting essentially in reacting, in stoichiometric amounts, an alkali metal sulphide and acetylene in a suitable solvent medium comprising an aqueous polar aprotic solvent, at a temperature of from room temperature to 170°C.

3,887,624
VINYLIDENE ALCOHOL COMPOSITIONS

Robert M. Gipson; Floyd E. Bentley, and John G. Milligan, all of Austin, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

Filed June 7, 1972, Ser. No. 260,545
Int. Cl. C07c *43/00*, *43/04*
U.S. Cl. 260—615 B 4 Claims

1. A vinylidene alcohol ethoxylate composition represented by the formula:



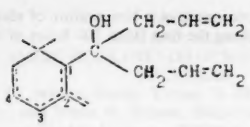
wherein, individually, *x* and *y* are numbers from 1 to 15 and the sum of *x* and *y* is a number in the range of 6 to 16 and wherein *w* is a number in the range of 7 to 15.

3,887,625
CYCLIC UNSATURATED ALCOHOLS

Karl-Heinrich Schulte-Elte, Onex, Geneva, Switzerland, assignor to Firmenich S.A., Geneva, Switzerland

Filed Jan. 29, 1973, Ser. No. 327,842
Claims priority, application Switzerland, Feb. 3, 1972, 1618/72
Int. Cl. C07c *33/02*
U.S. Cl. 260—617 R 6 Claims

1. Compounds having the formula



IIa

containing either a double bond in the 1-, (exo- or endocyclic) 2-, 3- or 4-position, or two conjugated double bonds in the 1- and 3- or (exocyclic) 2- and 3-positions, or two non-conjugated double bonds in the 1- and 4-positions of the ring.

3,887,626

OXIDATION OF 2-CHLOROBUTENE TO CHLOROPRENE

Abraham Nathan Kurtz, Charleston, W. Va., and Melvin Lee Farmer, Bangkok, Thailand, assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 6, 1973, Ser. No. 413,316
Int. Cl. C07c *17/00, 21/20*
U.S. Cl. 260—655 **6 Claims**

1. A process for the production of chloroprene which comprises introducing a feed mixture consisting essentially of oxygen and at least one of 2-chloro-2-butene and 2-chloro-1-butene, said feed mixture being free of hydrogen chloride, into a reaction zone containing a catalyst selected from the group consisting of magnesium chloride, rare earth metal chloride, and vanadium pentoxide, and maintaining said feed mixture in said reaction zone for a period of time and at an elevated temperature sufficient to produce chloroprene, said temperature being within the range of from about 450° to about 600°C.

3,887,627

PREPARATION OF UNSATURATED ALCOHOLS AND ETHERS

Michael G. Romanelli, New York, N.Y., assignor to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 113,591, Feb. 8, 1971, Pat. No. 3,769,352, which is a continuation-in-part of Ser. No. 808,673, March 19, 1969, Pat. No. 3,670,032. This application June 18, 1973, Ser. No. 370,722
Int. Cl. C07c *29/00*
U.S. Cl. 260—632 R **5 Claims**

1. A process for the formation of unsaturated alcohols which comprises contacting in the liquid phase a solution of a C_4 to C_6 acyclic aliphatic conjugated diolefin and water, said solution being free of dissolved oxygen, together with a solvent for said conjugated diolefin and water, said solvent to be selected from the group consisting of isopropanol, t-butanol and tetrahydrofuran, in the presence of a catalyst system comprised of a zero valent palladium material, selected from the group consisting of tetrakis (triphenylphosphine) palladium, tetrakis (tribenzylphosphine) palladium, tetrakis (diphenylalkylphosphine) palladium, tetrakis (phenyldialkylphosphine) palladium, tetrakis (trialkylphosphine) palladium, and a basic cocatalyst selected from the group consisting of tetralkyl and trialkylaralkyl ammonium hydroxides and alkoxides having from 4 to 20 carbon atoms at a temperature ranging from 0° to 160°C.

3,887,628

METHYLENE CHLORIDE STABILIZED WITH ORGANIC EPOXIDES

Norman L. Beckers, Chardon, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Feb. 23, 1973, Ser. No. 335,363
Int. Cl. C07c *17/40, 17/42*
U.S. Cl. 260—652.5 R **2 Claims**

1. A stabilized methylene chloride composition consisting essentially of methylene chloride and stabilizing amounts of from about 0.05 to about 2.0 percent by weight of the methylene chloride of each of butylene oxide and propylene oxide.

3,887,629

PURIFICATION OF FLUOROCARBONS

George B. Fozzard, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 1, 1973, Ser. No. 402,407
Int. Cl. C07c *17/38*
U.S. Cl. 260—653 **6 Claims**

1. A process for obtaining a high purity perfluoroalkane containing from 3 to 10 carbon atoms from a mixture thereof with a corresponding alkane which comprises extracting the mixture in a liquid phase at a temperature below about +20° C with toluene or xylene and subjecting the resulting raffinate to distillation and recovering from said distillation a perfluoroalkane of high purity.

3,887,630

ISOMERIZATION OF ALKYL AROMATIC HYDROCARBONS

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Feb. 4, 1974, Ser. No. 439,578
Int. Cl. C07c *15/02*
U.S. Cl. 260—668 A **10 Claims**

1. A process for the isomerization of alkyl aromatic hydrocarbons which comprises subjecting such hydrocarbon, or non-equilibrium mixtures thereof, to isomerization conditions in contact with a catalyst comprising as its essential active ingredient a hydrothermally stable Y zeolite prepared by the steps of:

1. subjecting an ammonium-sodium Y zeolite containing between about 1–5 weight-percent Na_2O to calcination in the presence of steam at temperatures above about 900°F but below the temperature at which appreciable thermal destruction of crystallinity occurs;
2. subjecting the resulting product to further ammonium ion exchange to replace at least about 25 percent of the zeolitic sodium ions with ammonium ions; and
3. calcining the resulting product at a temperature between about 700° and 1,200°F for a time sufficient to effect deammoniation without substantial dehydroxylation.

3,887,631

OXIDATIVE DEHYDROGENATION OF HYDROCARBONS

Roberta Yaffe, Fishkill, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed May 14, 1973, Ser. No. 359,953
Int. Cl. C07c *5/18*
U.S. Cl. 260—680 E **6 Claims**

1. The method of preparing butadiene from butene which comprises

contacting said butene in vapor phase in the presence of oxygen with a catalyst consisting essentially of

a CoO. *b* MoO_3 . *c* B_2O_3

wherein *a* is 0.75–1.25, *b* is 0.75–1.25, and *c* is 0.8–2;

maintaining said butene in contact with said catalyst for 0.5–7 seconds at 440°C–510°C thereby forming effluent gas containing butadiene; and

recovering said effluent gas containing said butadiene.

3,887,632

PROCESS FOR PURIFYING DIENE HYDROCARBONS FROM ACETYLENE HYDROCARBON CONTAMINANTS

Alexandr Grigorievich Liakumovich, Prospekt Lenina, 23, kv. 4; Nina Vasilievna Zakharova, ulitsa Khudaiberdina, 97, kv. 16; Rashid Idrisovich Khamidullin, Prospekt Lenina, 23, kv. 4, all of Sterlitamak Bashkirskoi, and Vladimir Mikhailovich Zakrevsky, ulitsa Ushakova, 40a, kv. 53, Tolyatti Kuibyshevskoi oblasti, all of U.S.S.R.

Filed Oct. 11, 1972, Ser. No. 296,648
Int. Cl. C07c 5/16, 7/00
U.S. Cl. 260—681.5 R 4 Claims

1. In a process for purifying diene hydrocarbons from acetylenic hydrocarbons contaminants comprising hydrogenating said acetylenic hydrocarbons with hydrogen over a catalyst which has been pre-activated with hydrogen, the improvement comprising washing said pre-activated catalyst with a saturated liquid hydrocarbon after the preactivation with hydrogen and prior to its use in hydrogenation of the acetylenic hydrocarbons.

3,887,633

POLYMER OILS AND PROCESS FOR PREPARING SAME

Tadahiro Go, and Motoyuki Yamato, both of Kawasaki, Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Aug. 6, 1973, Ser. No. 385,897
Claims priority, application Japan, Aug. 16, 1972, 47-81952
Int. Cl.[2] C07C 5/02
U.S. Cl. 260—683.9 10 Claims

1. A process for preparing a polymer oil of pour point of not higher than −30°C, a flash point of not lower than 180°C, a specific gravity of 0.92 – 0.94, an acid value of not more than 0.02mgKOH/g, a saponification value of not more than 0.02mgKOH/g, a Hazen number of not more than 50, a number average molecular weight of 300 – 1,000, and an iodine number of not more than 60 comprising the steps of:

polymerizing a monomer containing at least 80 percent of 1,3-pentadiene at temperatures of from −30°C to 100°C in the presence of a homogenizable Friedel-Crafts type catalyst to produce a liquid polymer having a number average molecular weight of 300 – 1,000 and an iodine number of not less than 250 wherein at least 70 percent of the pentadiene units is of trans structure, and then hydrogenating the thus-produced liquid polymer to the extent that its iodine number is decreased to not more than 60 as determined by Wijs method, thereby obtaining said polymer oil.

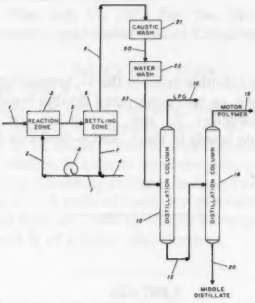
3,887,634

LIQUID PHOSPHORIC ACID CATALYZED POLYMERIZATION PROCESS

Mack F. Hughes, Albany, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 23, 1973, Ser. No. 418,631
Int. Cl. C07c 3/16
U.S. Cl. 260—683.15 C 3 Claims

1. In the startup of a process for polymerizing a feed of propylene, butylene, or mixtures thereof, by contacting the feed with a liquid phosphoric acid catalyst in a reaction zone at a temperature between about 200° and 350° F. and a pressure sufficient to maintain liquid phase, thereby obtaining a reaction zone effluent comprising hydrocarbons within the range of C_6 to C_{20} and phosphoric acid; removing the acid from the hydrocarbons in a settling zone; and returning the acid to the reaction zone, the improvement which comprises maintaining the reaction zone at a temperature of about 20° to 125° F. higher, during the first 10 to 100 hours of startup



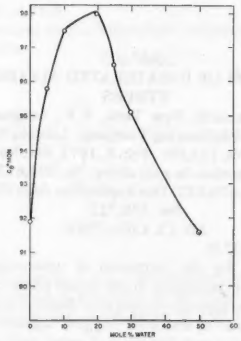
with fresh acid catalyst, than is maintained in steady-state operation after the catalyst has attained full activity.

3,887,635

ALKYLATION PROCESS UTILIZING HALOSULFURIC OR TRIHALOMETHYLSULFONIC ACID WITH A CATALYST MODERATOR

Paul T. Parker, Baton Rouge, La., and Ivan Mayer, Summit, N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 201,389, Nov. 23, 1971, abandoned. This application Aug. 27, 1973, Ser. No. 391,864
Int. Cl. C07c 3/54
U.S. Cl. 260—683.47 33 Claims



1. An alkylation process comprising introducing a paraffin feed and an olefin feed into an alkylation zone and contacting said feeds therein, at alkylation conditions, with a catalyst formed from a strong acid selected from the group consisting of halosulfuric acid, trihalomethanesulfonic acid and mixtures thereof, and the addition of about 5 to 100 mole %, based on acid, of (1) water, (2) a C_1—C_7 saturated aliphatic monohydroxy alcohol or (3) a mixture of water and said alcohol.

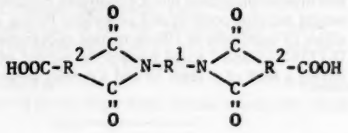
3,887,636
ORGANO(BLOCK-AMIDE-SILOXANE)-(BLOCK-AMIDE-IMIDE) POLYMERS

Peter C. Juliano, Scotia; Tyrone D. Mitchell, Troy, both of N.Y., and Simon W. Kantor, Ridgewood, N.J., assignors to General Electric Company, Schenectady, N.Y.

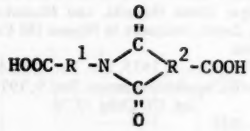
Filed Dec. 5, 1973, Ser. No. 422,024
Int. Cl. C08g *41/04, 47/10*
U.S. Cl. 260—824 R **19 Claims**

1. A process which comprises effecting a reaction between:

1. an organodicarboxyterminated imide of the formula selected from the group consisting of

A. 

and

B. 

or mixtures thereof, wherein R^1 is selected from the group consisting of substituted and unsubstituted divalent hydrocarbon radicals, and combinations thereof, and each R^2 is a trivalent aromatic hydrocarbon radical;

2. an organodicarboxyterminated polysiloxane of the formula

$$(HOOCR^3)_d(R^4)_{e+R^5})_fSiO_{(4-(d+e+f))/2}$$

wherein each R^3 is an alkylene radical of from about 2 to about 12 carbon atoms, R^4 and R^5 are monovalent hydrocarbon radicals, d is equal to from 0.001 to 1, inclusive, e is equal to from 0 to 2, inclusive, f is equal to from 0 to 3, inclusive, and the sum of d, e and f is equal to from 1.5 to 3, inclusive and;

3. an organodiisocyanate of the formula

$$O=C=N—R^6—N=C=O$$

wherein R^6 is selected from the group consisting of divalent hydrocarbon radicals which contain at least 3 carbon atoms and which are free from aliphatic unsaturation.

3,887,637
AMINOTRIAZINE-ALDEHYDE RESINS AND PROCESS FOR PREPARATION

Phillip A. Waitkus, Sheboygan, Wis., assignor to Plastics Engineering Company, Sheboygan, Wis.

Continuation-in-part of Ser. No. 232,964, March 18, 1972, Pat. No. 3,839,289. This application Apr. 8, 1974, Ser. No. 458,835
Int. Cl. C08g *9/24, 9/30, 9/32*
U.S. Cl. 260—828 **21 Claims**

1. A process for producing and curing a molding resin composition of improved curing and electrical resistance characteristics comprising the steps of reacting in a liquid medium:

a. a triazine compound selected from the class consisting of melamine and benzoguanamine;

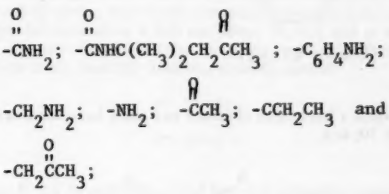
b. an aldehyde selected from the class consisting of formaldehyde, acetaldehyde, chloracetaldehyde and furfuraldehyde;

c. a vinyl compound having the formula

wherein

R is selected from the class consisting of hydrogen and an alkyl group of 1–4 carbon atoms, and

X is a radical selected from the class consisting of:



the proportion of said vinyl compound being 0.05–100 moles per mole of said triazine compound, and the proportion of said aldehyde being 0.5–6 moles per mole of said triazine compound with an additional 0.5–5 moles of aldehyde per mole of said vinyl compound;

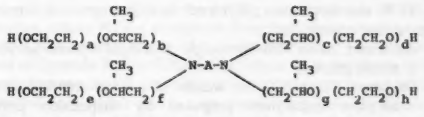
said reaction being conducted at a temperature of 60°–100°C. and a pH in the range of 7–12 and the water being eventually removed from the reaction mass by heating under reduced pressure until the resin product forms a brittle solid mass upon cooling; admixing said resin product with 5–99 percent by weight of an unsaturated polyester prepared by the condensation of a glycol with a dibasic carboxylic acid, at least 25% of the dibasic acid component being an unsaturated aliphatic dibasic acid; and thereafter curing the resultant resin mixture at a temperature of 25°–400°F. in intimate mixture with 0.05–10 percent by weight of a peroxy or azo free-radical generating catalyst.

3,887,638
ANTISTATIC FIBER CONTAINING CHAIN-EXTENDED TETROLS BASED ON DIAMINES

Lamberto Crescentini, and Rodney Lee Wells, both of Chester, Va., assignors to Allied Chemical Corporation, New York, N.Y.

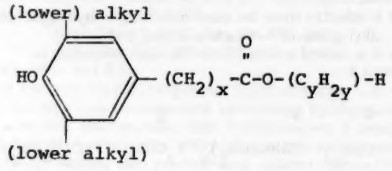
Division of Ser. No. 271,316, July 12, 1972. This application Aug. 5, 1974, Ser. No. 494,421
Int. Cl.² C08G *41/04*
U.S. Cl. 260—830 P **10 Claims**

1. In a process for the formation of an antistatic polyamide fiber from a fiber-forming polyamide polymer containing about 1 to 12% by weight of an antistatic compound which is a chainextended reaction product of a tetrol compound represented by the formula:

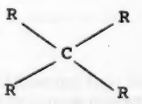


where *a*, *b*, *c*, *d*, *e*, *f*, *g*, and *h* are each a whole number and A is a difunctional radical from a hydrocarbon containing 1 to 13 carbon atoms, said tetrol compound having a molecular weight between about 4,000 and about 50,000 and at least one compound selected from the group consisting of diepoxides,

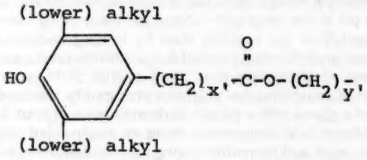
by extruding the molten polymer through an orifice into a quenching medium and thereafter stretching the resulting filaments, the improvement comprising dissolving in the extrudate prior to extrusion at least 0.1% by weight, based on the weight of the antistatic compound, of a phenol compound selected from the group consisting of:



in which x has a value of from 1 to 6 and y has a value of from 6 to 30; and



in which R is



wherein x' has a value from 1 to 6 and y' has a value of 1 to 6.

3,887,639

THERMOPLASTIC POLYBLENDS COMPRISING PVC-ACRYLATE AND POLYACRYLATE-VC COPOLYMERS AND BLENDS THEREOF WITH S-A PLASTICS

Adam F. Kopacki, Westwood, N.J.; John H. Deatcher, Lake Peekskill; Kenneth L. Eilers, Irvington, N.Y., assignor to Stauffer Chemical Co., Dobbs Ferry, N.Y. 10522

Filed Aug. 5, 1974, Ser. No. 494,643
Int. Cl. C08f *41/12*, C08f *29/24*
U.S. Cl. 260—876 R **29 Claims**

1. A thermoplastic polyblend having improved impact resistance comprising:
(a) about 20 to 90% by weight of a rigid styrene acrylonitrile plastic;
(b) about 10 to 60% by weight of a vinyl chloride-alkyl acrylate copolymer prepared by suspension polymerizing vinyl chloride in the presence of an alkyl acrylate polymer;
(c) about 1 to 30% of an alkyl methacrylate-vinyl chloride interpolymer prepared by polymerizing an alkyl methacrylate in the presence of a polyvinyl chloride suspension polymer, and
(d) about 0 to 40% by weight of polyvinyl chloride.

3,887,640

EXTRUSION COATING COMPOSITION CONTAINING ETHYLENEPROPYLENE BLOCK COPOLYMER AND POLYETHYLENE HAVING A MIR OF AT LEAST 50

Juan C. Diaz, and Ray Edwards, both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 15, 1972, Ser. No. 280,934
Int. Cl.[2] C08F *15/00*, *19/00*
U.S. Cl. 260—876 B **10 Claims**

1. An extrusion coating composition capable of providing extrusion coatings of less than 0.6 mil thickness characterized by good hardness, scuff resistance, impact strength, pinhole resistance and heat sealing properties consisting of a polymer blend consisting essentially of 40 to 99 percent, by weight, of an ethylene/propylene block copolymer containing at least 80 weight percent polymerized propylene having a flow rate of about 15 dg/minute to 100 dg/minute as determined by ASTM D-1238-52T and 1 to 60 percent, by weight, of polyethylene having a MIR of at least 50 and a density greater than 0.912.

3,887,641

METHOD FOR PRODUCING RESIN FOR PRINTING INK

Shozo Tsuchiya; Hideo Hayashi, and Hisatake Sato, all of Yokohama, Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Filed Dec. 3, 1973, Ser. No. 421,040
Claims priority, application Japan, Dec. 9, 1972, 47-123034
Int. Cl. C08g *37/20*
U.S. Cl. 260—845 **4 Claims**

1. A method for producing a resin for printing ink, which comprises reacting a cyclopentadiene resin obtained by heat-polymerizing at a temperature of 250°-350°C cyclopentadiene, dicyclopentadiene or an alkyl-substituted derivative thereof in the absence of a catalyst with an unsaturated carboxylic acid or its anhydride to form an acid-modified resin wherein the amount of the unsaturated carboxylic acid or its anhydride is 0.01 to 0.5 mol per 100 g of the cyclopentadiene resin, and reacting the acid-modified resin with a resol-type phenol-formaldehyde resin at a temperature of 100° to 250°C., the amount of the phenol-formaldehyde resin being at least 5 g per 100 g of the acid-modified resin, thereby to form a resin having a softening point of at least 100°C.

3,887,642

POWDERED THERMOSETTING COMPOSITIONS

André Vandersmissen, Brussels, Belgium, assignor to UCB, Brussels, Belgium

Filed Oct. 19, 1973, Ser. No. 407,985
Claims priority, application United Kingdom, Oct. 20, 1972, 48337/72
Int. Cl. C08g *37/34*, *37/32*
U.S. Cl. 260—850 **23 Claims**

1. A powdered thermosetting composition comprising
I. 50.01 to 149.99 parts by weight of a resinous constituent selected from the group consisting of
1. a mixture of a linear or branched chain saturated resin (A) containing free hydroxyl and/or carboxyl groups and an aminoplast resin (B) selected from the group consisting of polyamine-aldehyde resins, polyamide-aldehyde resins, etherified polyamine-aldehyde resins and etherified polyamide-aldehyde resins, and
2. a copolymer of a vinyl and/or an acrylic compound with a copolymerizable compound having free or alkoxylated methylolamide groups,
II. 0.01 to 10 parts by weight of a polycondensation catalyst (C) consisting of at least one monoester of a halogenated aromatic polycarboxylic acid derived from a monohydric alcohol selected from the group consisting of aliphatic alcohols having 1 to 18 carbon atoms, cycloaliphatic

alcohols having 5 to 7 carbon atoms, araliphatic alcohols having 6 to 8 carbon atoms, aromatic alcohols having 6 to 9 carbon atoms and heterocyclic alcohols having 5 to 8 carbon atoms and from a halogenated aromatic polycarboxylic acid containing at least one halogen selected from the group consisting of fluorine, chlorine and bromine and

III. 0.01 to 90 parts by weight of auxiliary agents (D) for coating compositions.

3,887,643

DIENE-LACTAM BLOCK COPOLYMERS

Charles M. Selman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

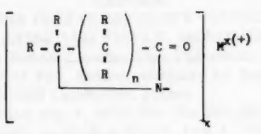
Continuation-in-part of Ser. No. 150,816, June 7, 1971, abandoned. This application Apr. 27, 1973, Ser. No. 355,002

Int. Cl. C08g *41/04*

U.S. Cl. 260—857 D **7 Claims**

1. A method of producing a diene-lactam copolymer which comprises:

a. reacting a metal salt of a lactam with a halogen-substituted isocyanate to produce a first reaction product, said metal salt having the formula



wherein R is selected from the group consisting of hydrogen, alkyl, cycloalkyl and aryl radicals or combinations thereof having from 1 to 10 carbon atoms and in which the total number of carbon atoms in such substituent groups is not greater than about 12; M is a metal selected from Group IA or IIA of the Periodic Table; and x is an integer equal to the valence of M; and in which said halogen-substituted isocyanate has the general formula X — R′ — NCO wherein X is chlorine, bromine or iodine; and R′ is a divalent hydrocarbon radical having from 4 to 12 carbon atoms; and n is an integer having a value of 1, 2, 4, 5 and 6;

b. reacting said first reaction product with a lithium-containing polymer to produce a second reaction product, said lithium-containing polymer comprising a lithium-containing polymer of a conjugated diene having 4 to 12 carbon atoms, or a polymer of a conjugated diene and a vinyl-substituted aromatic compound having 8 to 20 carbon atoms; and

c. reacting said second reaction product with a lactam monomer to produce a diene-lactam copolymer.

3,887,644

ANTISTATIC POLYAMIDE FIBER

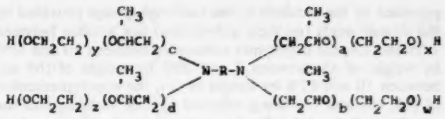
Rodney Lee Wells, Chester, Va., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Oct. 18, 1973, Ser. No. 407,680. The portion of the term of this patent subsequent to Nov. 13, 1990, has been disclaimed.

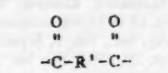
Int. Cl. C08G *41/04*

U.S. Cl. 260—857 PG **10 Claims**

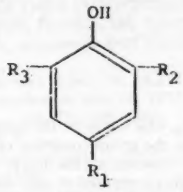
1. In a process for the formation of an antistatic polyamide fiber from a fiber-forming polyamide polymer containing about 1% to 12% by weight of an antistatic compound which is a chain-extended reaction product of a tetrol compound represented by the formula:



where a, b, c, d, w, x, y and z are each a whole number and R is a difunctional radical from a hydrocarbon containing 1 to 13 carbon atoms, said tetrol compound having a molecular weight between about 4,000 and about 50,000, and at least one compound selected from the group consisting of compounds which yield the following divalent radical:



where R′ is a difunctional radical from a hydrocarbon containing 1 to 30 carbon atoms, by extruding the molten polymer through an orifice into a quenching medium and thereafter stretching the resulting filaments, the improvement comprising dissolving in the extrudate prior to extrusion at least 0.5% by weight, based on the weight of the antistatic compound, of a phenol compound of the formula:



where R_1 is hydrogen or an alkyl radical containing 1 to 12 carbon atoms, R_2 is an alkyl radical containing 4 to 18 carbon atoms, and R_3 is an alkyl radical containing 4 to 18 carbon atoms.

3,887,645

COPOLYMERIZATE OF UNSATURATED POLYESTER, UNSATURATED MONOMER AND CARBOXY CONTAINING MONOMER

Jose Schwarcz, Vicente Lopez, Argentina, assignor to S. A. Alba, Buenos Aires, Argentina

Filed Jan. 2, 1974, Ser. No. 429,797

Claims priority, application Argentina, Jan. 4, 1973, 245991

Int. Cl. C08f *21/00, 21/02*

U.S. Cl. 260—861 **4 Claims**

1. A water-dilutable film-forming material that is a copolymer formed by the addition polymerization of (a) at least one neutral vinyl monomer of the formula $CH_2{=}CR_1R_2$, where R_1 is hydrogen or a methyl group and R_2 is a phenyl or a $COOR_3$ residue, where R_3 is a straight or branched chain alkyl group with 1 to 8 carbon atoms; (b) at least one acidic vinyl monomer of formula $R_4CH{=}CR_1COOH$, where R_1 is hydrogen or a methyl group and R_4 is hydrogen or a carboxyl group (or its internal anhydride) and (c) an unsaturated alicyclic dibasic acid (or its anhydride) of the class of the partially hydrogenated phthalic acids, and α,β-unsaturated acyclic dibasic acid (or its anhydride) and at least one alcohol with one or more esterifiable hydroxyl groups and in which the alicylic unsaturated acid comprises from 80 to 100% by weight, and the acyclic α,β-unsaturated acid from 0 to 20% by weight of the total dibasic acids and the molar ratio of the hydroxyl groups

provided by the alcohols to the carboxyl groups provided by the dibasic acids (or their anhydrides) has a value between 1.05 and 1.4, the copolymer containing between 30 and 80% by weight of a), between 3 and 20% by weight of (*b*) and between 10 and 67% by weight of (*c*), the copolymerization of (*a*), (*b*) and (*c*) being effected by free radicals and the copolymer being solubilized in water through partial neutralization of its free carboxyl groups with a base dissolved in water up to a pH value between about 7.5 and 10.

3,887,646

RESINOUS COMPOSITIONS CONTAINING POLYPHENYLENE ETHER, STYRENE RUBBER AND RUBBER-MODIFIED CHLOROSTYRENE POLYMER

Eiichi Yonemitsu, Kashiwa; Akitoshi Sugio, Tokyo; Masanobu Masu, Tokyo; Masaharu Kimura, Tokyo, and Seiichi Kamiyama, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Oct. 30, 1972, Ser. No. 301,729

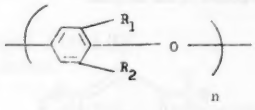
Claims priority, application Japan, Nov. 5, 1971, 46-87588

Int. Cl. C08f *15/00, 19/00*

U.S. Cl. 260—876 R **6 Claims**

1. A thermoplastic blended composition comprising

a. a polyphenylene ether having recurring units of the formula



wherein R_1 and R_2, which may be the same or different, are each selected from the group consisting of methyl and ethyl and n is an integer representing the degree of polymerization,

b. high styrene rubber composed of units derived from styrene and units derived from at least one conjugated diene monomer selected from the group consisting of butadiene, isoprene and chloroprene, obtained by copolymerization of styrene and the conjugated diene monomer, and in which the units derived from styrene amount to 40 to 60 percent by weight, and

c. a rubber-modified chlorostyrene polymer composed of units derived from at least one conjugated diene monomer selected from the group consisting of butadiene, isoprene and chloroprene and units derived from chlorostyrene, obtained by polymerization of a chlorostyrene monomer in the presence of a rubber component, and in which the units derived from the conjugated diene monomer amount to 2 15 percent by weight,

the proportions of components (*a*), (*b*) and (*c*) being in the ranges of 40 to 60 percent, 5 to 30 percent and 20 to 50 percent, by weight, respectively.

3,887,647

THERMOPLASTIC BLENDED RESINOUS COMPOSITION CONTAINING POLYPHENYLENE ETHER

Eiichi Yonemitsu, Kashiwa; Akitoshi Sugio; Seiichi Kamiyama; Masanobu Masu, and Masaharu Kimura, all of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Oct. 2, 1973, Ser. No. 402,820

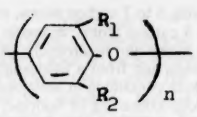
Claims priority, application Japan, Oct. 4, 1972, 47-98982

Int. Cl. C08f *15/00, 19/00*

U.S. Cl. 260—876 B **6 Claims**

1. A thermoplastic blended resinous composition comprising

a. 10 to 40 percent by weight of a polyphenylene ether having recurring units of the formula



wherein R_1 and R_2 are the same or different, and each represents a methyl or ethyl group, and n is a positive integer of at least 85 and represents the degree of polymerization,

b. 10 to 30 percent by weight of a block copolymer of a conjugated diene compound and styrene composed of units derived from styrene and units derived from a conjugated diene compound, in which the content of the units derived from styrene is 40 to 60 percent by weight, and

c. 50 to 75 percent by weight of a graft copolymer of chlorostyrene on a diene rubber substrate composed of units derived from a conjugated diene compound and units derived from chlorostyrene, in which the content of the units derived from the conjugated diene compound is 2 to 15 percent by weight,

the total of the proportions of these components being 100 percent by weight.

3,887,648

METHOD OF PRODUCING POLYMER COMPOSITIONS BASED ON CHLORINATED POLYETHYLENE

Akira Takahashi; Hiroo Kojima; Masao Ogawa, all of Tokyo; Hiroshi Osuka, Yokohama, and Shoichi Kobayashi, Tokyo, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 784,517, Nov. 22, 1968, Pat. No. 3,673,279, which is a continuation-in-part of Ser. No. 339,899, Jan. 24, 1964, Pat. No. 3,496,251. This application Apr. 16, 1971, Ser. No. 134,826

Int. Cl. C08f *15/00, 1/11*

U.S. Cl. 260—878 R **6 Claims**

1. In a method for producing a thermoplastic resin composition by contacting

A. a polymer component selected from the group consisting of chlorinated polyethylene of a degree of chlorination of 10–50% and a mixture consisting of 50–90% by weight of said chlorinated polyethylene and 10–50% by weight of copolymer selected from an ethylene-propylene copolymer rubber, an ethylene-propylene-nonconjugated diene terpolymer rubber and an ethylene-vinylacetate copolymer rubber, with

B. a monomer mixture comprising

b_1. at least one monomer selected from styrene, alpha-methyl styrene, tertiary butyl styrene and chlorostyrene, and

b_2. at least one monomer selected from acrylonitrile and methacrylonitrile

under polymerization conditions in the presence of a polymerization initiator to form an interpolymer of components (A) and (B), the improvement which comprises suspending said polymer component (A) and monomer component (B) in the form of fine particles in a state of separation from each other in an aqueous medium, said component (A) having a particle size of 5–150 Tyler mesh, the weight ratio of said component (A) to component (B) ranging from about 10:90 to about 65:35, said polymerization initiator being mixed in said component (B) prior to its suspension in the aqueous medium.

3,887,649

MOLDINGS MADE OF HYDROLYZED ETHYLENE-VINYL ACETATE COPOLYMER

Hiroshi Takida, Osaka, and Yoshimi Akamatu, Amagasaki, both of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki, Osaka, Japan

Filed July 18, 1974, Ser. No. 489,511
Int. Cl. C08g *39/10*
U.S. Cl. 260—873 **5 Claims**

1. A molding having an improved impact-resistance which comprises a hydrolyzed ethylene-vinyl acetate copolymer and 2 to 100 parts by weight of a block-copolymerized polyester-polyether elastomer per 100 parts by weight of said copolymer; said hydrolyzed ethylene-vinyl acetate copolymer having an ethylene content of 20 to 50% by mole, a vinyl acetate content of 80 to 50% by mole and a degree of hydrolysis in vinyl acetate component of not less than 90% by mole, and said block-copolymerized polyester-polyether elastomer having a melting point of crystalline region of 150° to 230°C. and an impact resilience of not less than 50%.

3,887,650

PROCESS FOR PREPARING BLOCK COPOLYMERS OF OLEFINS AND VINYLIC MONOMERS

Elias Agouri; Robert Laputte; Yves Philardeau, and Jacques Rideau, all of Pau, France, assignors to Aquitaine Total Organico, 92400 Courbevoie, France

Filed Aug. 1, 1973, Ser. No. 384,586
Claims priority, application France, Aug. 4, 1972, 72.28205
Int. Cl. C08f *15/00, 27/22*
U.S. Cl. 260—878 B **42 Claims**

1. A process for synthesizing block copolymers of olefins and vinylic monomers, comprising the steps of modifying in the absence of Ziegler-type catalysts, an olefinic polymer or copolymer containing terminal double bonds by the reaction with a compound of an element selected from boron and the metals in Columns II, III, IVA and VA of the periodic table of elements, in which at least one of the valencies of the element is saturated by a hydrogen atom or monovalent hydrocarbyl or hydrocarbyloxy radical, placing the resulting modified polymer in contact with an oxygenated free-radical-producing initiator and at least one vinylic monomer, and allowing polymerization of the monomer or monomers to take place within the resulting mixture.

3,887,651

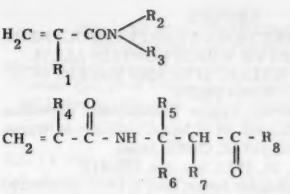
PROCESS FOR PREPARING COPOLYMER

Jihei Inomata, Tokyo; Masahiro Hayashi, Yokohama; Seiichi Nozawa, Tokyo; Takayuki Ota, Yokohama; Kazuo Endo, Yokohama, and Yukio Yamaguchi, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Japan

Filed Aug. 17, 1973, Ser. No. 389,132
Claims priority, application Japan, Aug. 17, 1972, 47-82272; Sept. 20, 1972, 47-94416
Int. Cl. C08f *15/40;* **C08d** *9/08*
U.S. Cl. 260—879 **14 Claims**

1. A graft copolymer prepared by a process, which comprises:

copolymerizing 60 – 90% by weight of acrylonitrile, of methacrylonitrile or mixtures thereof, 0.5 – 39.5% by weight of an alkylvinyl ether containing C_{1-4} alkyl groups and 0.5 – 20% by weight of an N-substituted acrylamide having a formula of



..... (I)

or

..... (II)

wherein

R_1 represents hydrogen or methyl; R_2 and R_3 represent hydrogen or a C_{1-8} alkyl group and at least one of R_2 and R_3 is an alkyl; R_4 represents hydrogen or methyl and R_5, R_6, R_7 and R_8 represent hydrogen or C_{1-4} alkyl groups, with a homopolymer of a conjugated diene or a copolymer containing at least 50 weight % of said conjugated diene and a vinyl monomer, wherein the total weight of the mixture of said nitrile, said vinyl ether and said N-substituted acrylamide is 3 – 50 times the weight of said homopolymer or copolymer, at 0°– 100°C.

3,887,652

PROCESS FOR PRODUCING TRANSPARENT GRAFT POLYMER COMPOSITIONS

Frederick E. Carrock, Paramus, and Frank K. Y. Chu, Ramsey, both of N.J., assignors to Dart Industries Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 88,216, Nov. 9, 1970, abandoned. This application May 10, 1973, Ser. No. 359,175
Int. Cl. C08f *19/08*
U.S. Cl. 260—880 R **10 Claims**

1. A process for preparing a transparent graft polymer composition comprising:

a. preparing a pregraft reaction product in emulsion and in the absence of added suspending agent by reacting a butadiene based rubber latex containing from 0 to 40% by weight of bound styrene (S_b) and having an average rubber particle size in the range of 0.01 to 0.8 micron with a first monomer mixture of styrene and methyl methacrylate having a weight ratio in the range of 5/95 to 80/20, the weight ratio of total monomers to total rubber solids being in the range of 5/95 to 60/40 under conditions such that essentially all of the monomer mixture is reacted, employing solely a water soluble emulsion polymerization catalyst in said preparation;

b. forming an aqueous suspension of a second monomer mixture of styrene and methyl methacrylate, the emulsion of pregraft reaction product from step (a) and an oil soluble initiator, the amount of emulsion being sufficient to provide a total rubber content in the final graft polymer composition in the range of 3 to 60 percent by weight and the weight ratio of styrene to methyl methacrylate in the second monomer mixture being such that the concentration of total styrene (Sa) basis the total amount of styrene and methyl methacrylate in the first and second monomer mixture is within the limits defined by the relationship wt%Sa = 23.4 + 0.766 (Sb)±10.

c. increasing the temperature of the suspension containing the emulsion of pregraft reaction product to an initial polymerization temperature in the range of 80°C to 150°C during which time the emulsion is substantially converted to a suspension;

d. polymerizing the monomers in the presence of the pregraft reaction product in suspension at temperatures in the range of 80°C to 150°C; and

e. recovering the graft polymer composition product in bead form directly from suspension.

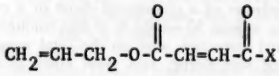
3,887,653

PROCESS FOR PRODUCTION OF GRAFT COPOLYMERS, THE SUBSTRATES OF WHICH CONTAIN ALLYL DERIVATIVES OF MALEIC ACID AND MALEIC ACID ANHYDRIDE

Kunio Konishi, Takatsuki; Tsuneo Tsubakimoto, Toyonaka, and Masao Nikki, Ibaragi, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Ltd., Osaka, Japan

Filed Nov. 28, 1972, Ser. No. 310,012
Claims priority, application Japan, Dec. 1, 1971, 46-096290
Int. Cl. C08f *15/00, 19/00*
U.S. Cl. 260—885 5 Claims

1. A process for the preparation of graft copolymers which comprises graft-copolymerizing styrene to substratum polymer (AB) having pendent double bonds, said substratum polymer (AB) being prepared from 0.1 to 20.0% by weight of at least one comonomer (A) expressed by the following general formula



wherein X is —OH, —O—CH_2—CH_2—OH, —O—CH_2—$CH(CH_3)$—OH, —O—$CH(CH_3)$—CH_2—OH, —O—CH_2—CH_2—NH_2 or —NH_2,
and 80.0 to 99.9% by weight of at least one ethylenically unsaturated monomer (B) selected from the group consisting of alkyl acrylates and alkyl methacrylates having 1 to 18 carbon atoms in the alkyl portion.

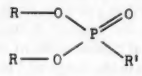
3,887,654

PHOSPHORUS CONTAINING REACTION PRODUCTS

Peter Hofmann, and Peter Rohringer, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 266,194, June 26, 1972, abandoned. This application Dec. 1, 1972, Ser. No. 311,052
Claims priority, application Switzerland, July 5, 1971, 9829/71
Int. Cl. C07f *9/40*
U.S. Cl. 260—928 9 Claims

1. Reaction product of
1. a phosphonic acid ester of the formula



wherein R and R′ each denotes alkyl with 1 to 4 carbon atoms,
2. an alcohol of the formula

X—OH

wherein X denotes monohydroxyalkyl or dihydroxyalkyl with 2 to 6 carbon atoms, with the boiling point of the alcohol of the formula

R—OH

wherein R has the indicated meaning, which is liberated during the reaction, being at least 30°C below the boiling point of the alcohol X—OH and
3. an epoxide with 2 to 4 carbon atoms in the presence of an alkali metal oxide, alkaline earth metal oxide or alkaline earth metal hydroxide.

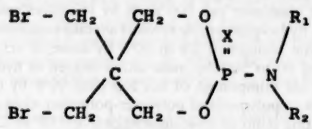
3,887,655

PHOSPHORAMIDATE ESTERS OF DIBROMONEOPENTYLGLYCOL

Kyung S. Shim, Irvington, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 252,680, May 12, 1972, abandoned, which is a continuation of Ser. No. 35,269, May 6, 1970, abandoned. This application Aug. 20, 1973, Ser. No. 389,829
Int. Cl. C07f *9/24*
U.S. Cl. 260—937 3 Claims

1. Compositions of matter in accordance with the formula:



wherein X is oxygen or sulfur, R_1 and R_2 are the same or different and are selected from the group consisting of alkyl containing from 1 to 10 carbon atoms, hydrogen, and phenyl.

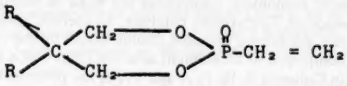
3,887,656

VINYL PHOSPHONATE ESTERS AND METHOD FOR THEIR PREPARATION

Kyung S. Shim, Irvington, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

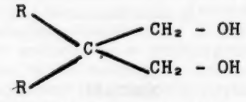
Filed Apr. 12, 1974, Ser. No. 460,399
Int. Cl. C07f *9/40*
U.S. Cl. 260—937 10 Claims

1. Compounds of the formula

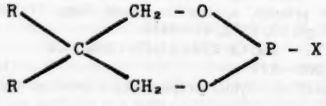


wherein R is selected from the group consisting of the straight and branched C_1-C_{12} alkyl groups, the phenyl group, the bromo and chloro substituted C_1-C_{12} alkyl groups, and the bromo and chloro substituted phenyl groups.

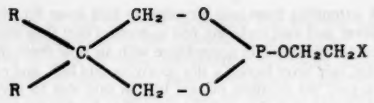
4. A process for forming compounds as set forth in claim 1 which comprises:
a. reacting a compound of the formula



with a compound selected from the group consisting of phosphorus trichloride and phosphorus tribromide to form a compound having the formula:

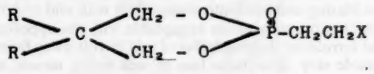


where X is selected from the group consisting of chlorine and bromine and R is as defined in claim 1;
b. reacting the product formed in step (a) with ethylene oxide to form a compound having the formula:



where R and X are as defined above;

c. reacting the product of step (b) with an Arbuzov rearrangement catalyst to form an Arbuzov rearrangement product having the formula:



where R and X are as defined above; and

d. dehydrohalogenating the product of step (c) with a base to form the compounds claimed in claim **1.**

3,887,657

PHOSPHORAMIDOTHIOATE ESTERS

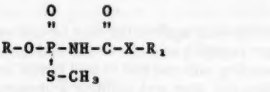
Robert D. Battershell; Russell M. Bimber, both of Painesville, and Janis A. Bungs, Willoughby, all of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Jan. 14, 1974, Ser. No. 433,219

Int. Cl. A01n *9/36*; **C07f** *9/16, 9/24*

U.S. Cl. 260—938 **3 Claims**

1. A compound of the formula



where R is alkyl of 1 to 5 carbon atoms;

X is oxygen; and

R_1 is phenyl or substituted phenyl wherein the substituents are selected from alkyl of 1 to 5 atoms, alkoxy of 1 to 5 carbon atoms, halogen, phenyl, napthyl, phenoxy, alkylthio of 1 to 5 carbon atoms, nitro, cyano, phenylthio, dialkylamino of 1 to 5 carbon atoms in each alkyl, carboxyl, carbalkoxy of 1 to 5 carbon atoms, sulfonic, and sulfonamido.

3,887,658

O-ALKYL-S-ALKYL-S-[1,2-BIS(ALKOXYCARBONYL)ETHYL]DITHIOPHOSPHATES

Alexis A. Oswald, Mountainside, and Paul L. Valint, Woodbridge, both of N.J., assignors to Ciba-Geigy AG, Basel, Switzerland

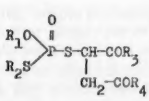
Filed Apr. 25, 1973, Ser. No. 354,404

Claims priority, application Switzerland, Apr. 27, 1972, 6265/72

Int. Cl. C07f *9/16*; **A01n** *9/36*

U.S. Cl. 260—942 **8 Claims**

1. A thiol phosphoric acid ester of the formula



wherein

R_1 represents methyl or ethyl, R_2 represents n-propyl, n-butyl, i-butyl, sec.butyl and R_3 and R_4 each represents straight or branched alkoxy containing 1 to 6 carbon atoms.

3,887,659

PROCESS FOR PRODUCING DIALKYL PHOSPHOROCHLORIDOTHIOATE

Hiroyuki Matsubara; Kennosuke Imamura; Yuhei Sogabe, and Toshio Aso, all of Tokyo, Japan, assignors to Nippon Chemical Industrial Co., Ltd., Tokyo, Japan

Filed Oct. 31, 1973, Ser. No. 411,571

Int. Cl. C07f *9/20*

U.S. Cl. 260—986 **6 Claims**

1. A process for producing dialkyl phosphorochloridothioate, which comprises chlorinating a dialkyl dithiophosphoric acid, and continuously mixing at a pH of 6 to 9 the reaction product obtained with a metal sulfide solution wherein said metal sulfide is an alkali metal sulfide, a water-soluble alkaline earth metal sulfide, the hydrosulfides thereof or the polysulfides thereof.

3,887,660

DEVICE FOR DISSOLVING A POORLY SOLUBLE GAS IN A LIQUID

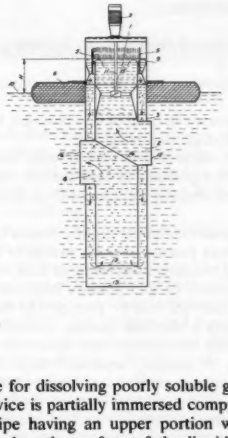
Hakan Wilhelm Romantschuk, and Pauli Unto Juhani Nyberg, both of Tampere, Finland, assignors to OY Tampella AB, Tampere, Finland

Filed Sept. 21, 1973, Ser. No. 399,492

Claims priority, application Finland, Sept. 25, 1972, 2625/72

Int. Cl. B01f *3/04*

U.S. Cl. 261—91 **4 Claims**



1. A device for dissolving poorly soluble gas in a liquid in which the device is partially immersed comprising:

an inner pipe having an upper portion with a first inlet located below the surface of the liquid for conducting liquid into said pipe and a first outlet located above the surface of the liquid forming an upper through-flow channel extending between said first inlet and said first outlet;

an outer pipe coaxial with and substantially surrounding said inner pipe and having a closed lower end below the lower end of said inner pipe,

said outer pipe being spaced from said inner pipe and defining therewith an annular throttling zone below said first outlet and above said first inlet;

said inner pipe having a lower portion with a second outlet communicating with the liquid below the surface of the liquid and a second inlet communicating with the interior of said outer pipe forming a lower through-flow channel extending between said second inlet and second outlet;

pumping means in said upper through-flow channel for drawing the liquid into said first inlet, out of said first outlet and into said throttling zone;

means, located in said throttling zone, for feeding a gas into the liquid in said zone; and

a partition wall separating said upper portion of said inner pipe from said lower portion thereof,

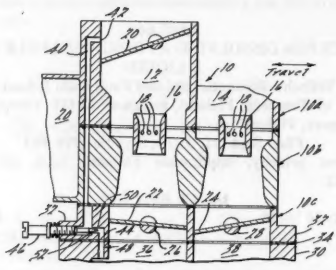
whereby the liquid flows downwardly through said outer pipe from said first outlet, through said throttling zone and into said second inlet.

3,887,661

TWO-STAGE CARBURETOR WITH IMPROVED IDLE AIR FUEL MIXTURE DISTRIBUTION

William K. Ojala, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed June 29, 1973, Ser. No. 375,215
Int. Cl. F02m 7/10
U.S. Cl. 261—23 A **6 Claims**



1. A two-stage carburetor for an internal combustion engine comprising in combination:

a housing;

at least one primary bore passage extending through said housing;

at least one secondary bore passage extending through said housing;

throttle valve means in each of said passages for controlling fluid flow through said passages;

linkage means connected to said throttle valve means for controlling the position of said throttle valve means in said passages whereby the rate of fluid flow may be controlled;

said linkage means including biasing means for biasing the secondary bore passage throttle means to a closed position and idle stop means defining at least one position of maximum closure of said primary bore passage whereby idle air/fuel mixture may be provided to the engine; and means forming a bleed air passage through said housing in parallel with said primary and secondary passages and arranged to be spatially separated from the secondary passage by the primary passage whereby leakage air flowing past the secondary bore passage throttle means may be compensated and the idle air/fuel mixture distribution may be balanced.

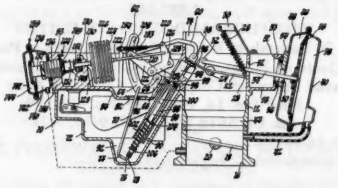
3,887,662

CARBURETOR

John A. Gural, Pittsford, and John W. Moulds, Penfield, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 4, 1974, Ser. No. 447,586
Int. Cl. F02m 7/22
U.S. Cl. 261—39 A **2 Claims**

1. A carburetor comprising a mixture conduit having an air inlet and a mixture outlet, a throttle disposed in said mixture outlet for controlling flow therethrough, an air valve disposed in said air inlet for measuring air flow therethrough, a fuel passage entending to said mixture conduit for supplying fuel thereto, a metering orifice disposed in said fuel passage, a metering rod disposed in said metering orifice for controlling fuel flow therethrough, a lever positioning said metering rod, a link extending from said air valve to said lever for moving said lever and said metering rod to control fuel flow through said metering orifice in accordance with air flow through said air inlet, said lever having a slot receiving said link, and means for varying the position of said link in said slot to vary the travel of said metering rod in said orifice for selected movement of said air valve, said means including a reciprocable plunger connected to said link, a ferrule surrounding said plunger, said plunger having an adjusting screw received in one end of said ferrule for varying the relative positions of said plunger and said ferrule, a wall, an adjustable stop supported in said wall and surrounding said ferrule, said ferrule having a head engageable with one end of said adjustable stop, spring means biasing said head into engagement with said end of said adjustable stop, stop means engageable with the opposite end of said ferrule for limiting travel of said ferrule away from said adjustable stop against the bias of said spring means, a diaphragm engaging said one end of said ferrule and cover means surrounding said one end of said ferrule and the opposite end of said ferrule for limiting travel of said ferrule away from said



adjustable stop against the bias of said spring means, a diaphragm engaging said one end of said ferrule and cover means surrounding said one end of said ferrule and the opposite end of adjustable stop and defining a chamber enclosed by said diaphragm and subjected to the pressure in said mixture conduit downstream of said throttle, whereby when said pressure is below a selected level said diaphragm may displace said ferrule and said plunger against the bias of said spring means to engage said ferrule with said stop means and to move said link in said slot to provide an enriched air-fuel mixture, whereby when said pressure is above said selected level said spring means may displace said ferrule, said diaphragm and said plunger to engage said ferrule head with said adjustable stop and to move said link in said slot to provide a lean air-fuel mixture, and whereby said air-fuel mixtures may be adjusted by removing said cover means and said diaphragm to expose said one end of said ferrule and said opposite end of said adjustable stop, by adjusting the position of said adjusting screw relative to said ferrule, and by adjusting the position of said adjustable stop relative to said wall.

3,887,663

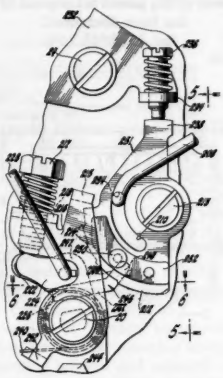
AIR VALVE CARBURETOR

John A. Gural, Pittsford, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 4, 1974, Ser. No. 439,286
Int. Cl. F02m 1/02
U.S. Cl. 261—50 A **3 Claims**

1. An internal combustion engine carburetor comprising a passage for air flow to the engine, a throttle disposed in said passage and rotatable between closed and open positions for controlling air flow therethrough, an air valve disposed in said passage upstream of said throttle and defining a controlled pressure region in said passage intermediate said air valve and said throttle, said air valve being rotatable between idle and open positions, means controlling said air valve to maintain a substantially constant pressure in said region whereby its rotative position is a measure of the rate of air flow through said passage, means connected to said air valve for supplying fuel to the engine at a rate proportional to the rotative dis-

placement of said air valve from said idle position and inversely proportional to the pressure in said region, a lever secured to said air valve for rotation therewith through a predetermined path, a stop member disposed in said path for limiting closing movement of said air valve to establish said idle position, and means connected to said throttle and en-



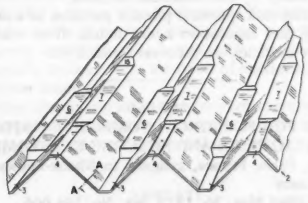
gageable with said stop member during movement of said throttle from said closed position for moving said stop member out of said air valve lever path whereby said air valve may be closed beyond said idle position to a closed position to decrease the pressure in said region and thereby increase the rate of fuel flow through said fuel supplying means.

3,887,664

CONTACT BODY FOR THE TRANSFER OF HEAT AND/OR SUBSTANCES

Ulrich Regehr, Susterfeld 65, D-51 Aachen, Germany

Filed Apr. 18, 1973, Ser. No. 352,467
Int. Cl. F28c *1/00*
U.S. Cl. 261—112 **8 Claims**



1. A contact body for the direct transfer of heat and/or substances between a liquid medium and a gaseous medium comprising in combination:

at least one first vertical flow sheet-panel having a plurality of equidistantly spaced regular undulations in its profile, defining parallel troughs with the undulations inclined to the vertical axis at an angle of less than ninety degrees;

at least one second vertical flow panel with similar undulations in its sheet profile, its undulations being oppositely inclined to the vertical axis at an angle likewise less than ninety degrees;

the first and second flow panels being contiguously joined together at the prominent areas of their undulations,

each said trough comprising: a plurality of first truncations at a first level adjacent to the imaginary tips of the said trough equidistantly spaced from each other;

said first level truncations defining ridges and bottoms;

a plurality of second truncations at a second level spaced from the said first level at a second level and equidistantly spaced from each other in the spaces between the said first truncations;

the latter being a series of contact areas where the bottoms of one flow panel meet the ridges of the adjoining flow panel;

the truncations of the first and second flow panels being of limited length in the undulation and being so arranged that a portion of the contact points between adjoining flow panels is eliminated;

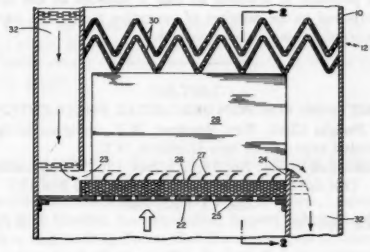
the adjoining flow panels thus being arranged for a top-to-bottom flow of a liquid medium and a transverse flow of a gaseous medium, the latter flow being facilitated by the elimination of some of the contact points.

3,887,665

VAPOR-LIQUID CONTACTING

Thomas William Mix, 24 Atwood St., Wellesley, Mass. 02181, and Alve John Erickson, 425 N. W. 3rd St., Chisholm, Minn. 55719

Filed Apr. 20, 1973, Ser. No. 352,927
Int. Cl. B01f *3/09*
U.S. Cl. 261—114 R **20 Claims**



1. In vapor-liquid contacting apparatus of the cross-flow type having a column housing and at least one contact stage in said housing, said apparatus including liquid and vapor inlets to said stage, and a liquid outlet from said stage, that improvement comprising

an orificed tray mounted in said housing at said stage, between said inlets,

said tray having free area comprising 15–55 percent of the total active area of the tray and being mounted with said free area in effective communication with both said inlets to permit vapor to rise through said tray to contact liquid thereabove and produce a two phase dispersion of vapor and liquid supported on said tray, and

means disposed adjacent a surface of said tray at said free area, in effective communication with said vapor inlet and said liquid inlet, for damping fluid oscillations impinging upon said free area of said tray and for thereby reducing the vapor velocity through said free area required to prevent dumping.

3,887,666

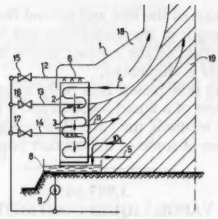
COOLING SYSTEM

Laszlo Heller; Laszlo Forgo; Janos Bodas; Istvan Papp, all of Budapest, Hungary; G. Sz. Agejev, and I. A. Alekszejev, both of Moscow, U.S.S.R., assignors to Transelektro Magyar Villamossagi Kulkereskedelmi Vallalat, Budapest, Hungary

Filed June 29, 1973, Ser. No. 375,281
Claims priority, application Hungary, July 3, 1972, EE2041
Int. Cl. F28c *1/00*
U.S. Cl. 261—130 **9 Claims**

1. A cooling system for cooling a flow medium, comprising an essentially vertical heat-transfer means adapted for flow of said flow medium therethrough, means for transporting an air current past said heat transfer means, spray nozzles disposed at a plurality of levels and arranged for spraying water onto said heat transfer means, a plurality of valve means, the spray

nozzles at each of said levels being associated with one of said valve means for permitting and preventing flow of cooling water therethrough, and a plurality of pumps for pumping the cooling water to the nozzles, the hydraulic capacities of said pumps being such that when all the pumps are operative the



resultant water pressure is sufficiently high so that all of the nozzles are supplied with cooling water under pressure whereas when one or more of said pumps is inoperative the water pressure is lowered so that a number of the nozzles proportional to the number of operative pumps are supplied with cooling water under pressure.

3,887,667

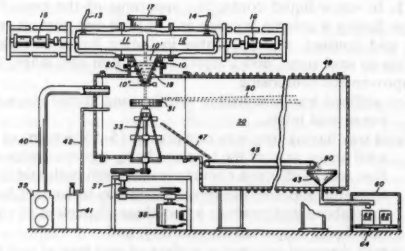
METHOD FOR POWDER METAL PRODUCTION

Irvin Dwight Clark, New Hartford, N.Y., assignor to Special Metals Corporation, New Hartford, N.Y.

Continuation of Ser. No. 55,123, July 15, 1970, abandoned. This application Aug. 6, 1973, Ser. No. 386,127

Int. Cl. B22f *9/00*

U.S. Cl. 264—8 **5 Claims**



1. A method of producing metallic powder of a superalloy wherein each element in the alloy is present in each particle of powder in substantially equal amounts, which comprises the steps of: arranging a statically cast superalloy consumable electrode having a heterogeneous make-up in a substantially horizontal position; arranging a second electrode in a substantially horizontal position; melting said consumable electrode by striking an electric arc between it and said second electrode; collecting molten metal droplets from said consumable electrode in a heated reservoir, said droplets having varying compositions; holding said molten metal in said reservoir for a period of time sufficient to homogenize it; passing said homogenized molten metal from said reservoir; atomizing said homogenized molten metal and cooling it to a temperature below its melting point as it passes from said reservoir, thereby forming metallic superalloy powder, each particle of powder containing each element in said alloy in substantially equal amounts; and collecting said powder, said powder being processable into parts having excellent high temperature strength.

3,887,668

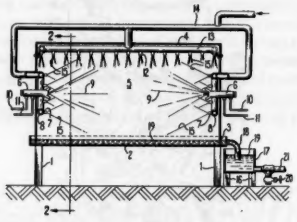
METHOD OF PRODUCING POWDER COMPOSED OF PRECISELY SPHERICAL PARTICLES

Kazuo Honjo, Nishinomiya, Hyogo, Japan, assignor to Ideki Co., Ltd., Japan

Continuation-in-part of Ser. No. 95,403, Dec. 4, 1970, Pat. No. 3,739,049. This application May 3, 1973, Ser. No. 356,951The portion of the term of this patent subsequent to June 12, 1990, has been disclaimed.

Int. Cl. B01j *2/06*

U.S. Cl. 264—14 **8 Claims**



1. A method for producing a powder of spherical particles of a synthetic resin, comprising:

a. dissolving a synthetic resin in a volatile organic solvent to form a solution having a viscosity of about 5 to about 200 centistokes;

b. directing a spray of said solution under a pressure of at least 6.5 kg/cm² into a chamber to form spherical particles thereof;

c. directing into said chamber a spray of a liquid as a separation agent and intersecting said spray of solution, said resin being insoluble in said liquid separation agent, and the spraying force of said liquid separation agent being about 3 kg/cm² and less than that of said sprayed solution;

d. volatilizing the solvent from the particles of said sprayed solution to form spherical particles of resin powder falling in said chamber, said particles of liquid separation agent serving to separate said powder particles rendered sticky by said volatilization; and,

e. collecting said spherical powder particles in a tank containing said separation agent liquid, from which said powder particles are recovered and dried.

3,887,669

METHOD FOR FORMING A COMPOSITE OBJECT OF ACRYLIC RESIN AND SILICONE ELASTOMER

Jean Pillet, Paris, France, assignor to Rhone-Poulenc, S.A., Paris, France

Filed Mar. 26, 1973, Ser. No. 345,066

Claims priority, application France, Mar. 28, 1972, 72.10821

Int. Cl. A61c *13/00*

U.S. Cl. 264—16 **5 Claims**

1. In a process of producing a solid composite object comprising an acrylic resin portion adhering to a silicone elastomer portion, the improvement comprising bringing into direct contact with one another and without an intervening priming layer a first mixture comprising a peroxide catalyst and a methyl methacrylate composition which can be hot cured in the presence of a peroxide catalyst and a second mixture comprising a peroxide catalyst and vulcanisable polydiorganosiloxane rubber with a chain which consists of 85 to 99.95% of $(CH_3)_2SiO$ units, 0 to 10% of $(C_6H_5)_2SiO$ units and 5 to 0.05% of $CH_3(CH_2{=}CH)SiO$ units and is blocked at each end by a $(CH_3)_3SiO_{0.5}$ or $(CH_3)_2(CH_2{=}CH)SiO_{0.5}$ unit and then heating the first mixture and second mixture in direct contact with one another until a solid object is produced.

3,887,670

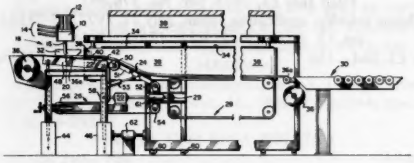
APPARATUS FOR AND METHOD OF PRODUCING CONTINUOUS FOAMED PLASTIC BUNSTOCK

Lawrence C. Porter, Palos Verdes Penninsula, Calif., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed July 23, 1973, Ser. No. 381,923

Int. Cl. B29d *27/04*

U.S. Cl. 264—41 **14 Claims**



1. A method of producing longitudinally continuous foamed bunstock from a reactive liquid polymeric mix to provide a continuous length expanded cellular product of substantially rectangular cross section, uniform density and cell isotropicity, which comprises the steps of

advancing a continuous conveyor surface along a predetermined path of travel, said conveyor surface comprising a lower supporting portion and separate upstanding portions on laterally opposite sides of said lower portion and defining together a generally trough-like moving mold for the developing foam product;

depositing reactive liquid polymer mix on said conveyor surface at a first point in its path of travel;

advancing said conveyor surface in a generally horizontal plane with reacting liquid mix thereon to a second point along its path of travel;

adjusting flow-impeding means disposed across said conveyor path intermediate said first and second points to produce a continuous pooling of said liquid mix therebetween to establish a stable cream line in the pooled liquid transversely of the path of travel and immediately ahead of said second point;

adjusting the path travelled by the lower portion of said conveyor between said second point and a third point downstream thereof to conform said path approximately to the mirror image of the characteristic rise profile of the particular polymer mix developed in the time interval of conveyor travel between said second and third points, wherein said third point is adjustably positioned to substantially coincide with the point of maximum rise of the polymer foam; and

thereafter continuing said conveyor surface travel from said third point through a curing zone to a point of discharge for the finished expanded cellular product.

3,887,671

PROCESS FOR PRODUCING GRANULAR, EXPANDED CERAMIC MATERIALS

Emil Metzger, 8240 Thayngen, Zieglerweg 54, Switzerland

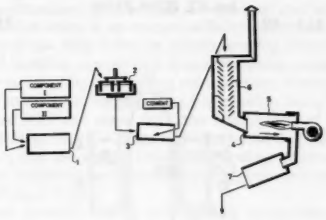
Filed Mar. 1, 1972, Ser. No. 230,660

Claims priority, application Germany, Mar. 5, 1971, 2110498

Int. Cl. B28b *5/00*; **B29d** *27/04*

U.S. Cl. 264—43 **12 Claims**

1. A process for manufacturing granular expanded ceramic materials comprising forming a prime material consisting of at least 25% of gas forming mineral substances, selected from the group consisting of distensible clay, argillite or a volcanic earth and the balance of mineral substances with a SiO_2 content exceeding 65% after grinding, selected from the group consisting of sea sand and sandstone, mixing and homogenizing the material into pellets by the addition of water containing NaOH; completely surrounding said pellets, while in the moist condition, by a layer of cement applied in a rolling or tumbling operation, drying and preheating said pellets in a drying kiln for a period of about 20 minutes at temperatures up to approximately 700°C. maximum, heating said pellets



with a very quick rise in temperature in a firing kiln for a period of not less than 3–5 minutes up to 1,000° to 1,200°C., and finally slowly cooling down said pellets to below 550°C. to form grains.

3,887,672

MANUFACTURE OF SADDLE-SHAPED DISCS FROM EXPANDABLE STYRENE POLYMERS

Erhard Stahnecker, Ziegelhausen; Georg Ruppert, Ludwigshafen; Rolf Moeller, Ludwigshafen; Rupert Schick, Ludwigshafen, and Ludwig Zuern, Bad Duerkheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 2, 1972, Ser. No. 303,138

Claims priority, application Germany, Nov. 4, 1971, 2154754

Int. Cl. B29d *27/00*

U.S. Cl. 264—51 **1 Claim**

1. A process for the manufacture of saddle-shaped discs from styrene polymers which process comprises: passing molten styrene polymers containing at least 50% by weight of polymerized styrene units through an extruder at melt temperatures of from 90° to 150°C to form cyclindrical extrudates containing an expanding agent; passing said extrudates through a coolant at such a rate that no expansion takes place, the residence time in the cooling bath being such that the extrudate remains internally plastic; shaping said extrudates by passing the extrudates at temperatures of from 70° to 90°C between rollers to form strands having an oval cross-section; slicing said shaped strands in the direction of the short axis of said oval cross-section to form discs of which the ratio of thickness to short axis is from 1:5 to 1:10, the thickness being measured in the machine direction of the extrudate; and thereafter foaming said discs to form particles having a bulk density of from 4 to 15 g/l.

3,887,673
APPARATUS AND METHOD FOR MANUFACTURING TUBULAR FILM OF THERMOPLASTIC RESIN

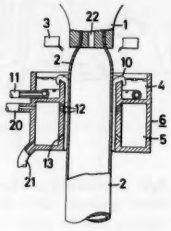
Wasuke Sato, and Osamu Uemura, both of Tokyo, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 164,599, July 21, 1971, abandoned. This application July 13, 1973, Ser. No. 378,950

Claims priority, application Japan, July 24, 1970, 45-64331; Dec. 8, 1970, 45-108080

Int. Cl. B29d *23/04*

U.S. Cl. 264—89 11 Claims



1. An apparatus for production of a tubular film of crystallized thermoplastic resin which comprises in combination, a thermoplastic resin extruding ring for extruding a tubular film of crystallizable thermoplastic film, an inflation means for inflating said tubular film, and a water-cooling tank, said water-cooling tank having an inner cylindrical wall defining a cooling zone, a sizing zone and a draining zone, a pliable cooling element having high water retention disposed over the inner cylindrical wall, a water supply chamber, one end of said pliable cooling element being immersed in water in said water supply chamber, suction orifices disposed through the cylindrical wall at the sizing zone and passing to a vacuum chamber, water draining orifices disposed through the cylindrical wall at the draining zone and passing to a water drain chamber, and means for passing the extruded film of thermoplastic film from the extruding ring into the water-cooling tank wherein the film is cooled to a temperature below the crystallization point at the sizing zone while under influence of internal pressure and external suction.

3,887,674
PIPE PART WITH A WIDENED END

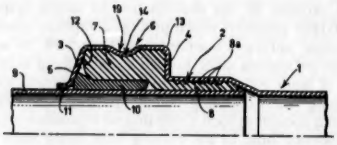
Albertus Anthony Oostenbrink, Hardenberg, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Filed June 29, 1973, Ser. No. 375,154

Claims priority, application Netherlands, June 30, 1972, 7209102

Int. Cl. B29c *17/04*

U.S. Cl. 264—94 1 Claim



1. A method for manufacturing a plastic pipe part with widened end, in which is provided a circular groove-shaped chamber, comprising deforming a pipe part by introducing internal overpressure and surrounding the pipe part to be deformed by a die with at least one recess, forming the groove-shaped chamber deformed with a substantially rectangular cross-section, defining a recess in said pipe part, the bottom of which is provided with a circular raised part extending all round, and forming an all round extending raised part merging by rounded sides with the bottom of the recess.

3,887,675
METHOD FOR MAKING SLIDELESS FASTENER

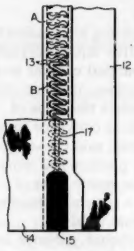
Toshiaki Takagi, Osaka, Japan, assignor to Yoshiaki Takagi, Osaka, Japan

Filed July 13, 1973, Ser. No. 378,897

Claims priority, application Japan, July 27, 1972, 47-76148

Int. Cl. A44b *19/42*; B29c *17/02, 17/14*

U.S. Cl. 264—156 2 Claims



1. In a method for making a slideless fastener which includes a tape-like fastening element adapted to be mounted on one part to be fastened and cooperable with a spiral fastening element adapted to be mounted on the other part to be fastened, the steps of making said tape-like fastening element comprising:

forming first and second rows of cuts longitudinally arranged at predetermined intervals along a resilient tape of thermally settable material, the cuts in each row being substantially semi-circular in shape and the cuts in one row being paired with and oriented in the reverse direction with respect to those in the other;

forming a series of tongues on one face of said tape by bending the semi-circular cut-out portions in said tape out of the plane of said tape with the bent out portions lying at at least a slight angle to the longitudinal direction of said tape;

forming a third row of cuts between said first and second row of cuts on the tape with the cuts in the third row joining the cuts of the first and second rows;

exerting a force on said tongues laterally of said tape to urge said tongues to positions which are twisted away from their initial positions toward positions more nearly parallel with the longitudinal direction of said tape for distorting the edges of the tape material along said cuts of said third row of cuts into the corresponding openings left by the bending of the tongues out of the first and second rows of cuts, and then folding the side edge portions of said tape against said tongues, and then releasing said lateral force, whereby the resiliency of the tape material causes said side edges to return to their original position and said tongues to twist at least partially back toward their original positions and leave openings between the edges of said cuts in said third row for receiving the spires of the spiral fastening element; and

inserting the spires of the spiral fastening element into the thus formed openings and thermally setting said tape material.

3,887,676
POLYVINYLCHLORIDE GRAFT VINYL CHLORIDE ONTO AMIDO BACKBONE AND POLYVINYL ALCOHOL AS FILM OR FIBER

Seizo Okamura; Tomoaki Tagawa; Kazuo Yagami; Kazuto Matsuo; Mitsuo Sakabe; Tsutomu Sogo, all of Kyato, Japan; Mikio Korematsu, deceased, late of Fukuoka, Japan, and by Etsuko Korematsu, widow and legal successor, Fukuoka, Japan, assignors to Kohjin Co. Ltd., Japan

Continuation-in-part of Ser. No. 230,478, Feb. 29, 1972, abandoned, which is a continuation of Ser. No. 821,066, May 1, 1969, abandoned. This application Apr. 5, 1973, Ser. No. 348,069

Claims priority, application Japan, May 7, 1968, 43-30471; May 7, 1968, 43-30472; Sept. 16, 1968, 43-66794; Apr. 15, 1969, 44-29264

Int. Cl. C08f *15/06;* **D01f** *7/04*

U.S. Cl. 264—184 **3 Claims**

1. A method for producing a fiber or film which comprises emulsion polymerizing vinyl chloride in an aqueous solution of a water-soluble amido-terpolymer consisting of acrylamide, diacetone acrylamide and sodium methallylsulfonate, said amido-terpolymer containing at least 80 mole percent amido-groups, in the presence of a catalyst and an emulsifying agent whereby an aqueous emulsion of polyvinyl chloride containing a graft polymer, in which a part of the vinyl chloride is grafted onto the water-soluble amido-terpolymer, is obtained wherein the amount of said amido-terpolymer is less than 20 percent by weight based on the total weight of the grafted and ungrafted polyvinyl chloride and then adding to the aqueous emulsion thus obtained, 40 to 150 percent by weight of polyvinyl alcohol based on the total weight of the grafted and ungrafted polyvinyl chloride in the emulsion to form a spinning dope, and then coagulating the spinning dope into a fiber or film.

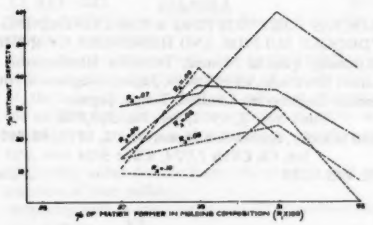
3,887,677
PROCESS OF MAKING A DYNAMOELECTRIC MACHINE STRUCTURE BY PRESSURE MOLDING

Thomas F. Deuter, Jonesboro, Ark., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 180,770, Sept. 15, 1971, Pat. No. 3,763,080. This application Sept. 20, 1973, Ser. No. 399,110

Int. Cl. B29f *1/10;* **C08g** *51/04*

U.S. Cl. 264—272 **11 Claims**



1. A method of manufacturing a dynamoelectric machine structure including a winding support, windings supported on the winding support, and a protective structure surrounding at least a portion of the windings, the method comprising the steps of:

positioning at least a portion of the windings in a mold cavity defining structure;

injecting a pressure molding composition under a pressure differential of at least about 40 psi into said cavity in intimate engagement with at least a portion of the windings;

said pressure molding composition comprising a blended, stable mixture of a liquid thermosetting synthetic resinous matrix forming material, an inorganic particulate material having a particle size distribution such that about 95 to 100 percent passes a 30 mesh sieve, at least about 50 percent passes a 40 mesh sieve and is retained on a 100 mesh sieve, and no more than a minor amount passes a 200 mesh sieve, and a finely divided solid particulate separation inhibitor selected from the group consisting of colloidal silica, powdered asbestos, powdered silica, and mixtures thereof, said particulate separation inhibitor having a particle size smaller than 325 mesh and at least one dimension smaller than one micron; said separation inhibitor being in an amount sufficient to prevent separation of the filler from the matrix forming material when said molding composition is injected under pressure into the mold cavity, the weight ratio of matrix forming material to the total weight of the composition being between about 0.27 and about 0.33; the weight ratio of inhibitor to matrix material being between about 0.05 and about 0.10; and the weight ratio of particulate material to the total weight of the composition being between about 0.65 and about 0.75;

at least partially curing said molding composition so injected to form a rigid, nonporous, dimensionally stable, protective structure at least partially surrounding said windings and winding support; and

removing the winding support, windings and protective structure from the mold cavity.

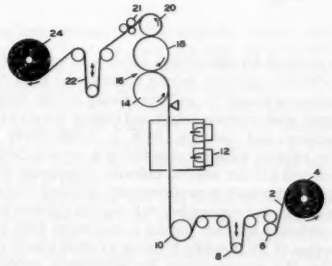
3,887,678
MECHANICALLY EMBOSSED RESILIENT LAMINAR FLOOR MATERIAL

Walter J. Lewicki, Jr., Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Continuation-in-part of Ser. No. 315,522, Dec. 15, 1972, abandoned. This application Feb. 15, 1974, Ser. No. 442,770

Int. Cl. B29c *15/00*

U.S. Cl. 264—284 **2 Claims**



1. A process for mechanically embossing a floor covering material consisting of the steps of:

a. passing a flexible sheet material having a printed pattern thereon by a heater structure which applies heat to only the upper side of the flexible sheet material, said sheet material being formed of a backing layer, an intermediate layer of a flexible foamed material and an upper thinner embossable layer of a wear resistant material,

b. heating the sheet material for a short time to a very high temperature on its upper layer, while maintaining approximately a 100°-200° F temperature differential at the point of embossing between the upper layer heated side of the sheet material which faces the heater structure and the flexible foamed side of the sheet material facing away from the heaters,

c. immediately feeding the heated sheet material into an embossing structure having a back-up roll and an embossing roll in engagement with the upper layer surface of the sheet material which had faced the heater, and completely bottoming out the embossing roll against the sheet material without the collapse of all or part of the foam structure intermediate layer underlying the embossed heated upper layer, and

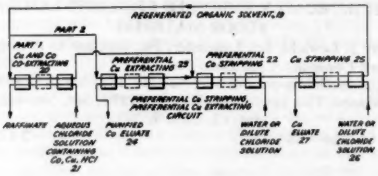
d. providing the embossing roll with cooling means and wrapping the sheet material around approximately one-half of the circumference of the embossing roll to cool the sheet material after the embossed pattern has been placed thereon to provide a product having a substantially undamaged foam cell structure in the intermediate layer under the embossed areas which is capable, upon reheating of the sheet material, of exerting sufficient stress upon the upper layer to restore the upper layer to its unembossed state, the sheet material being guided in a direction transverse of its direction of movement and the peripheral speed of the embossing roll being controlled so that the embossed pattern is placed on the sheet material in registry with the printed pattern thereon.

3,887,679

SEPARATION OF COPPER FROM COBALT

Eivind Wigstol, and Kjell Elnar Froyland, both of Kristiansand-S, Norway, assignors to Falconbridge Nickel Mines Limited, Toronto, Ontario, Canada

Filed May 31, 1972, Ser. No. 258,396
Int. Cl. C01g *3/00, 51/00*
U.S. Cl. 423—24 **8 Claims**


REGENERATED ORGANIC SOLVENT, 19
PART 2
PART 1
Co AND Co CO-EXTRACTING 20
PREFERENTIAL Co EXTRACTING 23
PREFERENTIAL Co STRIPPING 22
Cu STRIPPING 25
PREFERENTIAL Co STRIPPING, PREFERENTIAL Co EXTRACTING CIRCUIT
RAFFINATE
AQUEOUS CHLORIDE SOLUTION CONTAINING Co, Cu, HCl 21
PURIFIED Co ELUATE 24
WATER OR DILUTE CHLORIDE SOLUTION
Cu ELUATE 27
WATER OR DILUTE CHLORIDE SOLUTION 26

1. In a method for recovering cobalt and copper from an aqueous chloride solution having a minimum total chloride concentration of about 7N, and containing cobalt, copper and hydrochloric acid in which cobalt and copper are co-extracted by contacting said solution with a substantially water-immiscible organic solution containing a tertiary amine solvent which will extract anionic chloride complexes of cobalt and copper and cobalt is preferentially stripped from the so produced cobalt and copper-bearing organic solution by water or dilute chloride solution having a maximum total chloride concentration of 5N, thereby forming a cobalt eluate containing copper, the improvement for separating copper from cobalt comprising,

i. dividing the water-immiscible organic solution into a first part and a second part,

ii. co-extracting cobalt and copper into the first part thereby forming a first cobalt and copper-bearing organic solution,

iii. preferentially extracting copper from the cobalt eluate containing copper into the second part, thereby forming a purified cobalt eluate and a second cobalt and copper-bearing organic solution, said cobalt eluate containing copper having a maximum chloride concentration of 5N,

iv. combining the first and second cobalt and copper-bearing organic solutions thereby forming a combined loaded organic solution,

v. preferentially stripping cobalt from the combined organic solution with an aqueous solution having a maximum chloride concentration of 4N, thereby forming the cobalt eluate containing copper and a cobalt-depleted organic solution,

vi. stripping copper from the cobalt-depleted organic solution thereby forming a copper eluate and a stripped organic solution, and,

vii. recycling the stripped organic solution.

3,887,680

PROCESS FOR RECOVERING TUNGSTEN FROM TUNGSTEN CARBIDES CONTAINING AN IRON GROUP OF METALS

Martin B. MacInnis; Clarence D. Vanderpool, both of Towanda, and Carl W. Boyer, Wysox, all of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 23, 1973, Ser. No. 408,494
Int. Cl. C01g *41/00*
U.S. Cl. 423—55 **5 Claims**

1. In a process wherein a composition comprising tungsten carbide particles cemented with cobalt as a binder is oxidized to a friable oxidation product, the product is thereafter formed into discrete particles and the particles are treated to recover the tungsten values, the improvement comprising:

a. oxidizing said composition in air at a temperature between about 800°C and 900°C for a time sufficient to form a friable oxidation product and

b. recovering tungsten valves by digesting the particles of oxidation product in an aqueous alkali metal hydroxide solution at a temperature of from about 140°C to 195°C and under pressure of from about 50 to 200 pounds per square inch for about 6 to 10 hours to form watersoluble alkali metal tungstate and a sludge containing cobalt values

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3,887,681

SEPARATION OF GALLIUM FROM ALKALINE LIQUORS USING ACETYLACETONE

Pierre De La Breteque, Marseille-St. Louis, and Marc Beerli, Paris, both of France, assignors to Swiss Aluminum Ltd., Switzerland

Filed Oct. 5, 1972, Ser. No. 295,277
Claims priority, application Switzerland, Oct. 6, 1971, 14556/71
Int. Cl. B01d *11/00;* **B01j** *1/04;* **C01f** *1/00, 3/00, 7/00;* **C01g** *15/00;* **C22b** *21/00, 35/00, 61/00*
U.S. Cl. 423—112 **4 Claims**

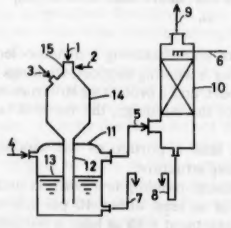
1. A process for separating gallium from solution which comprises adding to an aqueous solution of aluminate in which gallium is dissolved, and containing between about 100 grams per liter and about 180 grams per liter of Na_2O, acetylacetone as a complexing agent, and extracting the complex by means of an organic solvent which is substantially immiscible with water.

3,887,682

PROCESS FOR PURIFYING A GAS CONTAINING HYDROGEN SULFIDE AND HYDROGEN CYANIDE

Seiji Kumata; Youichi Shimoi; Terubika Hirabayashi, and Yukinori Hiwatashi, all of Tokyo, Japan, assignors to Nittetu Chemical Engineering Limited, Tokyo, Japan

Filed Nov. 2, 1972, Ser. No. 303,078
Claims priority, application Japan, Nov. 2, 1971, 46-86765
Int. Cl. C01b *17/24;* **C01c** *3/04*
U.S. Cl. 423—232 **2 Claims**



1. In a process for purifying a gas containing hydrogen sulfide and hydrogen cyanide in which said gas is washed with

an aqueous alkaline solution to dissolve the hydrogen sulfide as hydrosulfide and the hydrogen cyanide as cyanide, the aqueous solution containing hydrosulfide and cyanide being oxidized to form thiocyanates, sulfur oxide salts and a precipitate of free sulfur which precipitate is then removed from the aqueous alkaline solution; the improvement which comprises: reductively roasting the aqueous alkaline solution containing thiocyanates and sulfur oxide salts in a combustion zone at 650°–1100°C and with an air ratio of less than 0.95 to convert at least a portion of said thiocyanates and sulfur oxide salts to sulfides; dissolving said sulfides to form a thiocyanate and sulfur oxide salt depleted alkaline solution; and recycling said depleted solution to the alkline aqueous wash solution.

3,887,683

METHOD FOR REMOVING NITROGEN OXIDES FROM WASTE GASES

Yasuhiko Abe, and Hisayoshi Yamaguchi, both of Annaka, Japan, assignors to Shin-Etsu Handotai Co., Ltd., Japan

Filed Aug. 23, 1973, Ser. No. 391,021

Claims priority, application Japan, Aug. 23, 1972, 47-84325; Sept. 6, 1972, 47-89283

Int. Cl. B01d *53/34*

U.S. Cl. 423—235 **5 Claims**

1. A method for removing nitrogen oxide from waste gases which comprises:

a. washing the waste gas with water or alkaline solution;

b. adding ammonia to the washed waste gas;

c. passing the ammonia-washed waste gas mixture in contact with a catalyst selected from the group consisting of activated charcoal and vanadium trioxide supported on activated charcoal at a temperature between room temperature and 150°C with a space velocity of from 1,000 to 50,000 parts by volume at standard temperature and pressure of the gas mixture per hour per part by volume of the catalyst; and

d. subjecting the thus-treated gaseous mixture to a dust collection treatment.

3,887,684

REMOVAL OF SULFUR DIOXIDE FROM WASTE GASES

Frank S. Griffith, Palmerton, Pa., assignor to The New Jersey Zinc Company, Palmerton, Pa.

Filed Sept. 28, 1973, Ser. No. 401,747

Int. Cl. C01b *17/00*

U.S. Cl. 423—242 **10 Claims**

1. A process for recovering sulfur dioxide from dilute sulfur dioxide gases, comprising:

a. contacting said gases with an aqueous solution of zinc sulfate in which the concentration of zinc in and the pH of, the aqueous solution of zinc sulfate is maintained, by the addition of a zinc oxide containing material, at levels sufficient to produce a zinc sulfite-zinc sulfate precipitate, and

b. absorbing sulfur dioxide from said gases in said aqueous solution of zinc sulfate,

c. removing said precipitate from said aqueous solution of zinc sulfate.

3,887,685

AUTOMATIC FEED BLOCK MOLDING PRESS FOR GRANULAR MATERIALS

Franz Stelzmuller, Oensingen, Switzerland, assignor to Von Roll A.G., Gertafingen, Switzerland

Filed July 31, 1973, Ser. No. 384,390

Claims priority, application Switzerland, Aug. 3, 1972, 11488/72

Int. Cl. B30b *11/02, 15/30*

U.S. Cl. 425—260 **7 Claims**

1. A block molding press particularly suited for forming block electrodes by compression of granulated material mixed with a binder comprising, in combination with a press frame:

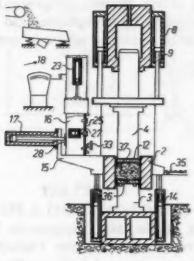
mold means open above and below;

an upper and a lower compression means fitting into said mold means respectively from above and below;

actuating means for moving said mold means and at least one of said compression means vertically with respect to said press frame;

a dosage device (**18**) for said granular material;

a laterally movable charging container (**16**) movable between a position below the discharge of said dosage device and a position above the upper opening of said mold means (**2**) and having an openable wall (**25**), said charging container means (**16**) also being open above and below and being slidably supported on a surface flush with the top of said mold means (**2**) provided by bracket means (**15**) affixed to said mold means (**2**);



lateral drive means (**17**) for laterally moving said charging container (**16**) for charging said mold means (**2**) and expelling a previously pressed block in synchronism with operation of said actuating means; and

operating means (**27**) connected to said openable wall (**25**) for opening and closing said wall and for maintaining said wall in open or closed position as required in synchronism with the operation of said actuating means and said lateral drive means,

said actuating means and said lateral drive means being so synchronized that one of said compression means protrudes at least part way into said charging container (**16**) before said charging container is moved away from its said position above the upper opening of said mold means.

3,887,686

PHARMACEUTICAL COMPOSITIONS CONTAINING A 2-(FURYL-METHYL)-6,7-BENZOMORPHAN AND METHOD OF USE

Herbert Merz; Adolf Langbein; Helmut Wick, and Klaus Stockhaus, all of Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

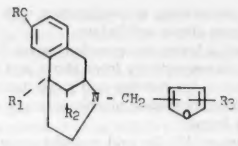
Division of Ser. No. 222,669, Feb. 1, 1972, Pat. No. 3,823,150. This application Jan. 24, 1974, Ser. No. 436,168

Claims priority, application Germany, Feb. 8, 1971, 2105743; Feb. 25, 1971, 2108954

Int. Cl. A61k *27/00*

U.S. Cl. 424—267 **13 Claims**

1. A pharmaceutical dosage unit composition having analgesic and antitussive activity consisting essentially of an inert pharmaceutical carrier and an effective analgesic or antitussive amount of a racemic mixture of a compound of the formula



wherein

R is hydrogen, methyl or acetyl,

R_1 is hydrogen, methyl, ethyl, n-propyl, isopropyl or butyl, and

R_2 and R_3 are each hydrogen, methyl or ethyl;

or an optically active isomer component thereof; or a non-toxic, pharmacologically acceptable acid addition salt of said racemic mixture or optically active isomer.

3,887,687

RECOVERY OF BORON FROM A POLYMER MATRIX

John T. Buford, Joplin, Mo., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 14, 1973, Ser. No. 397,463

Int. Cl. C01b *9/00, 35/00*

U.S. Cl. 423—292 **6 Claims**

1. A method for recovering boron dissolved or dispersed in a polymeric or elastomeric matrix which comprises heating the matrix to a temperature in the range 500° to 800° C. in an inert atmosphere for a time sufficient to effect thermal dissociation of the polymer, reacting the thermally dissociated residue with a halogenating reagent selected from the group consisting of Cl_2 or Br_2 at a temperature in the range 500° to 800° C., and then distilling the halogenation reaction product to obtain a purified BCl_3 or BBr_3 fraction.

3,887,688

PROCESS FOR REFINING AQUEOUS SOLUTION OF THIOCYANATE CONTAINING IMPURITIES

Yukio Shimosaka; Masahiko Ozaki, and Jiro Negi, all of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Filed Jan. 31, 1974, Ser. No. 438,350

Claims priority, application Japan, Feb. 15, 1973, 48-18619

Int. Cl. C01c *3/20*

U.S. Cl. 423—366 **7 Claims**

1. A process for refining an aqueous solution of a thiocyanate containing impurities which comprises (a) feeding an aqueous solution of a thiocyanate containing impurities to a cross-linked dextran layer so that the impurities and thiocyanate may be caught in said cross-linked dextran layer, (b) then passing an eluent in an amount necessary to flow away the impurities through said cross-linked dextran layer so that the impurities may be flowed away together with the eluent, and (c) then further passing an eluent through said cross-linked dextran layer so that the effluent eluent containing the thiocyanate may be separated.

3,887,689

CARBONATION OF AMMONIACAL SODIUM CHLORIDE BRINE

John Raymond Carding, and Cyril Peover, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 26, 1973, Ser. No. 344,599

Claims priority, application United Kingdom, Mar. 27, 1972, 14250/72

Int. Cl. C01d *7/1*

U.S. Cl. 423—423 **8 Claims**

1. In a method of carbonating ammoniacal sodium chloride brine in an ammonia soda-Solvay process wherein a phenol-free or phenol-deficient ammonia is used and the phenolic compound content of the brine is below 10 milligrams per litre of ammoniacal sodium chloride brine and the carbon dioxide content of waste gas is above 12% by volume, the improvement comprising adding a sufficient amount of one or more phenolic compounds to the process to increase the phenolic compounds content of the brine to between 10 and 250 milligrams per litre and to reduce the carbon dioxide content of the waste gas to less than 12% by volume.

3,887,690

PROCESS FOR PRODUCING CARBON BLACK

Jesse R. West, Houston, Tex.; Ollie Middlebrooks, West Monroe, La., and William B. Crull, Dumas, Tex., assignors to Continental Carbon Company, Houston, Tex.

Continuation-in-part of Ser. No. 776,038, Nov. 15, 1968, abandoned. This application Mar. 11, 1971, Ser. No. 123,453

Int. Cl. C09c *1/48, 1/50*

U.S. Cl. 423—456 **3 Claims**

1. In a process for the production of carcass grades of oil furnace carbon black in which a carbon black feedstock is introduced axially into one end of an elongate, substantially cylindrical, refractory lined reactor of substantially uniform diameter into a primary reaction zone heated by primary hot combustion gases from the burning of a hydrocarbon gas or other fuel with air, said combustion gases flowing in longitudinal downstream flow, the improvement which comprises:

a. supplying said primary hot combustion gases in an amount of about 3500–5200 BTU per pound of said feedstock;

b. supplying secondary heat to said reactor as a stream or streams of secondary combustion gases introduced in tangential flow at a point or points located at distances downstream of the point of introduction of said primary heat equal to about 6–14 times the inside diameter of said refractory lining, the amount of said secondary heat being about 1000-2500 BTU per pound of said feedstock;

c. the ratio of the quantity of said primary heat to said secondary heat being from about 2 to about 4.

3,887,691

CHEMICAL PROCESS

Paul Kobetz, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed July 17, 1972, Ser. No. 272,314

Int. Cl. C01b *7/00;* **C01f** *7/02*

U.S. Cl. 423—462 **13 Claims**

1. A process for hydrolyzing aluminum alkoxides to produce alcohol and a hydroxy chloroaluminum compound which comprises:

reacting an aluminum alkoxide having from about 6 to about 30 carbon atoms per alkoxide group and hydrochloric acid in molar proportions of from about ½ to about 1 mol of hydrochloric acid per mol of aluminum alkoxide in an aqueous system to form a two phase reaction product system, one of said phases being an organic phase, the other of said phases being an aqueous solution of $AlCl_{0.5-1.0}(OH)_{2.5-2.0}$, and separating the phases.

8. An improved method for producing aluminum oxide or aluminum hydroxide which comprises:

reacting an aluminum alkoxide having from about 6 to about 30 carbon atoms per alkoxide group and hydrochloric acid in molar proportions of from about ½ to about 1 mol of hydrochloric acid per mol of aluminum alkoxide in an aqueous system to form a two phase reaction product system, one of said phases being an organic phase, the other of said phases being an aqueous solution of $AlCl_{0.5-1.0}(OH)_{2.5-2.0}$, separating the phases and vaporizing water and hydrochloric acid from the $AlCl_{0.5-1.0}OH_{2.5-2.0}$ to produce a residue of aluminum hydroxide or aluminum oxide.

3,887,692

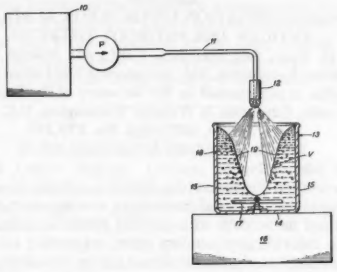
MICROSPHERICAL BASIC ALUMINUM HALIDES AND METHOD OF MAKING SAME

William S. Gilman, South Plainfield, N.J., assignor to Armour Pharmaceutical Company, Phoenix, Ariz.

Filed July 10, 1972, Ser. No. 269,991

Int. Cl. C01d *7/00, 7/02, 7/56*

U.S. Cl. 423—462 **20 Claims**



1. A basic aluminum halide in solid microspherical form in which the solid spherical particles have a diameter of 2 to 500 microns prepared by a process comprising the steps of discharging an aqueous solution of a halide having the formula $Al_n(OH)_xQ_y.XH_2O$ wherein $x + y = 3n$, x is 2 or more, X is 2 to 4 and Q is chlorine or bromine or mixtures thereof, in finely divided form, into the cavity in a whirling vortex of an organic alcohol having 4 or 5 carbon atoms and a branched methyl group, and separating the resulting aluminum halide microspheres from said alcohol.

3,887,693

CONTINUOUS PROCESS FOR OBTAINING ALUMINIUM FLUORIDE BY REACTING FLUOSILICIC ACID WITH AN ALUMINOUS MATERIAL

Antonio Escribano Nevado, Bilbao/Vizcaya; Eduardo Chapela Lago, Castro Urdiales/Santander, and Jesus Gutierrez Hernandez, Algorta/Vizcaya, all of Spain, assignors to Derivados del Fluor, S.A., Spain

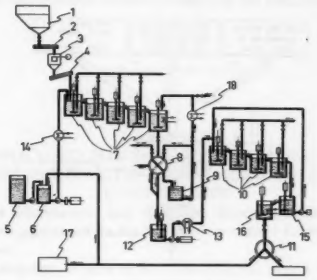
Filed May 25, 1973, Ser. No. 363,872

Claims priority, application Spain, May 26, 1972, 403234; May 8, 1973, 414546

Int. Cl. C01f *7/50;* **C01b** *33/12*

U.S. Cl. 423—489 **12 Claims**

1. Continuous process for obtaining aluminum fluoride by reacting fluosilicic acid with an aluminous material, forming a suspension of insoluble silica hydrate and a supersaturated solution of α-allotropic aluminum fluoride, which reaction is carried out by using fluosilicic acid having a concentration of 5 to 25%, previously heated to approximately 60° to 95°C, and finely pulverized alumina or bauxite hydrate high in silica; the reaction mixture being maintained at a temperature above 90°C, for a reaction time from 5 to 60 minutes, the process being carried out continuously in a battery of reactors arranged in cascade, the reaction being effected progressively from the first to the last reactor; the reaction flow being uniform; and the reactants being continuously introduced through the first reactor uniformly and continuously in such amount that the suspension emerging from the last reactor is



maintained at a pH between 1 and 3, the insoluble silica hydrate being separated from said suspension which emerges from the last reactor, while said supersaturated α-allotropic aluminum fluoride solution obtained is lead to a battery of crystallizers, arranged in cascade, where the α-aluminum fluoride is continuously converted to its insoluble β-allotropic state.

3,887,694

PRODUCTION OF CHLORINE

Wendell E. Dunn, Jr., Sydney, Australia, assignor to Titanium Technology N.V., Curacao, Netherlands Antilles

Continuation-in-part of Ser. No. 108,571, Jan. 21, 1971, abandoned. This application Dec. 22, 1972, Ser. No. 317,744

Int. Cl. C01b *7/00*

U.S. Cl. 423—500 **11 Claims**

1. A process for producing chlorine comprising the steps of:

a. heating a mixture comprising:

1. a hydrated ferric chloride of the formula $FeCl_3.nH_2O$ wherein n is a number in the range of 0 to 6 or an aqueous solution of ferric chloride and an alkali-metal chloride wherein the mole ratio of alkali-metal chloride to ferric chloride is in the range of 0.75:1 to 4:1;
2. ferric oxide wherein the mole ratio of ferric oxide to ferric chloride is 0.2 to 1.0;
3. water; and
4. at least a sufficient amount of hydrogen chloride or hydrochloric acid to react with iron oxides a

at a temperature in the range of 180° to 310°C. and distilling all of the water as water or hydrochloric acid to produce a dehydrated product; and

b. reacting the dehyrated product of (a) with at least a stoichiometric amount of an oxygen containing gas, at a temperature in the range of 400° to 1,200°C., to produce chlorine, iron oxide and unreacted chlorides.

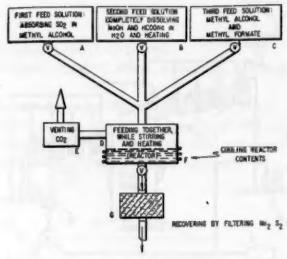
3,887,695
PRODUCTION OF SODIUM HYDROSULFITE FROM FORMATES

Jack Plentovich, Nansemond County; Charles Ellis Winslow, Jr., Norfolk, and Mearl A. Kise, Portsmouth, all of Va., assignors to Virginia Chemicals Inc., Portsmouth, Va.

Continuation-in-part of Ser. No. 9,078, Feb. 5, 1970, Pat. No. 3,576,598. This application Nov. 16, 1970, Ser. No. 89,720The portion of the term of this patent subsequent to Apr. 27, 1988, has been disclaimed.

Int. Cl. C01b *17/98*

U.S. Cl. 423—515 **6 Claims**


FIRST FEED SOLUTION: ABSORBING SO2 IN METHYL ALCOHOL
SECOND FEED SOLUTION: COMPLETELY DISSOLVING NaOH AND HCOONa IN H2O AND HEATING
THIRD FEED SOLUTION: METHYL ALCOHOL AND METHYL FORMATE
A
B
C
VENTING CO2
FEEDING TOGETHER, WHILE STIRRING AND HEATING
COOLING REACTOR CONTENTS
RECOVERING BY FILTERING Na2S2O4

1. Method of preparing sodium hydrosulfite ($Na_2S_2O_4$) from formates comprising:

A. absorbing sulfur dioxide (SO_2) in methyl alcohol (CH_3OH) as a first feed solution;

B. dissolving sodium hydroxide (NaOH) and sodium formate ($HCOONa$) in water (H_2O) and heating to effect complete solution of all solids, as a second feed solution;

C. feeding a small amount of methyl alcohol (CH_3OH) and methyl formate ($HCOOCH_3$) to a reactor, as a third feed solution, while heating in the range 60° to 90° C. and stirring under superatmospheric pressure within said reactor;

D. sequentially feeding together under pressure said first and second feed solutions as a reaction liquid into said reactor while stirring and heating in the range 60° to 90° C. under a superatmospheric pressure;

E. venting carbon dioxide (CO_2) from said reaction liquid within said reactor;

F. cooling said reactor and contents;

G. recovering by filtering sodium hydrosulfite ($Na_2S_2O_4$) solids from said reaction liquid; and

H. recovering methyl formate ($HCOOCH_3$) together with methyl alcohol (CH_3OH), sequentially of filtering said hydrosulfite from said reaction liquid, and recycling both said methyl formate ($HCOOCH_3$) and said methyl alcohol (CH_3OH) into said third feed solution.

3,887,696
PROCESS AND APPARATUS FOR HETEROGENEOUS CATALYSIS OF A CHEMICAL REACTION, PARTICULARLY CATALYTIC DECOMPOSITION OF HYDROGEN PEROXIDE

Michel Louis Bernard, Poitiers, and Gerard Coudrin, Nantes, both of France, assignors to Republic of France, Paris, France

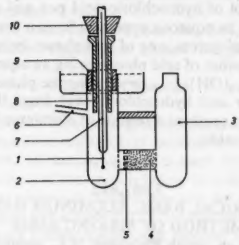
Filed Dec. 26, 1972, Ser. No. 318,655

Claims priority, application France, Dec. 23, 1971, 71.46266

Int. Cl. C01b *13/02*

U.S. Cl. 423—579 **9 Claims**

1. In a process of heterogeneous catalysis of a chemical reaction comprising catalytic decomposition of aqueous solutions of hydrogen peroxide, the catalyst utilized being metallic and belonging to the class constituted by transition elements of groups I, VI, VII and VIII, the improvement comprising subjecting the said catalyst to a cathode or alternating voltage which has the effect of electrochemically polarizing it and increasing the catalytic reaction at said catalyst cathode, the



nature of the catalyst and the level of the applied voltage being such as to effect release of oxygen primarily at the catalyst cathode.

3,887,697
HEMAGGLUTINATION METHOD FOR AUSTRALIA ANTIGEN AND ANTIBODY THERETO

Girish N. Vyas, San Francisco, Calif., and Nahum Raphael Shulman, Kensington, Md., assignors to The United States of America as represented by the Secretary of the Department of Health, Education & Welfare, Washington, D.C.

Filed Aug. 9, 1971, Ser. No. 170,292

Int. Cl. C12k *1/00;* **G01n** *31/00, 33/16*

U.S. Cl. 424—12 **8 Claims**

1. A method for measuring Australia antigen in serum or other biological material comprising coating inert indicator human red blood cells with purified Australia antigen using chromic chloride as a coupling agent, suspending said coated cells in phosphate buffered saline solution containing bovine serum albumin, polyvinyl pyrrolidone, and polyoxyethylene sorbitan monooleate, adding an aliquot of a predetermined dilution of antibody to said antigen to each of serial two-fold dilutions of said serum or other material, and adding said suspension of coated cells to said serum-antibody mixture, whereby inhibition of hemagglutination in 1:2 dilution and higher dilutions indicates the presence of said antigen in said serum.

3,887,698
SACS WITH EPITOPIC SITES ON WALLS ENCLOSING STABLE FREE RADICALS

Harden M. McConnell, Palo Alto, and Gillian K. Humphries, Los Altos, both of Calif., assignors to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Continuation-in-part of Ser. No. 339,775, March 12, 1973, abandoned. This application Feb. 25, 1974, Ser. No. 445,392

Int. Cl. G01n *27/00, 31/02, 33/16*

U.S. Cl. 424—12 **12 Claims**

1. A composition useful in immunoassay comprising vesicles or liposomes having at least one epitopic site on the external walls thereof, said walls enclosing an aqueous medium including stable free radicals comprising electron spin resonance labels, said free radicals being in sufficient concentration to provide an electron paramagnetic resonance spectrum of at least about 3 gauss in half width, peak to peak, at a resonance frequency of about 9.2 gigahertz.

8. A composition useful in immunoassay comprising erythrocyte ghosts having at least one epitopic site on the external walls thereof, said walls enclosing an aqueous medium including stable free radicals comprising electron spin resonance labels, said free radicals being in sufficient concentration to provide an electron paramagnetic resonance spectrum of at least about 3 gauss in half width, peak to peak, at a resonance frequency of about 9.2 gigahertz.

3,887,699

BIODEGRADABLE POLYMERIC ARTICLE FOR DISPENSING DRUGS

Seymour Yolles, 404 Stamford Dr., Newark, Del. 19711

Continuation-in-part of Ser. No. 809,946, March 24, 1969, abandoned. This application Dec. 29, 1970, Ser. No. 102,431

Int. Cl. A61k *27/12*

U.S. Cl. 424—19 9 Claims

1. An article for controllably dispensing drugs comprising: a. a plurality of spheroidal shaped, homopolymers and copolymers of lactic acid, said polymers being prepared from cyclic esters of optically active or inactive lactic acids, or mixtures thereof, having a sufficiently high molecular weight to retain structural integrity of said spheroids for an effective period of time upon implantation, with the proviso that crystalline spheroids having relatively long duration upon implantation are formed from pure optically active lactic acids and spheroids having rapid release upon implantation are formed from lactic acid polymers having a lower degree of crystallinity with b. an effective amount of a solution of a drug said solution of drug substantially at the center of said spheroids exuding or migrating, upon implantation, from the interior to the surface of the spheroid until said surface is coated with a drug and an equilibrium is established between the surface layer and the drug at the interior of the polymeric material such that if the surface layer is partially or totally removed the equilibrium is destroyed and further amounts of the drug migrate to the surface until equilibrium is reestablished so that this cycle repeats itself until the supply of drug is exhausted.

3,887,700

ANALGESIC FORMULATIONS

Graham Arthur Boncey, Cowley; Maurice John Hedge, Windsor, and James Rae Henderson, High Wycombe, all of England, assignors to Aspro Nicholas Ltd., Stough, England

Division of Ser. No. 92,284, Nov. 23, 1970. This application Nov. 12, 1973, Ser. No. 415,247

Claims priority, application United Kingdom, Nov. 28, 1969, 58203/69

Int. Cl. A61k *11/02*

U.S. Cl. 424—44 5 Claims

1. An effervescent composition comprising one part of free flowing readily wetable coated aspirin particles, of which at least 95 percent by weight are not more than 150 microns, comprising: one part of aspirin to one to one ninth part of a coating agent comprising at least one ingredient selected from glycine, methionine, sucrose, lactose, arabino galactan sugar products, manitol, inositol, and sorbitol; said coating agent also comprising up to 5 percent by weight of a wetting agent; and up to 10 percent by weight of a film forming agent selected from hydroxyethyl cellulose, hydroxy propyl methyl cellulose, sodium carboxymethyl cellulose, starches, dextrin, dextran, gun acacia, gum tragicanth and polyvinyl pyrrolidone: and three to six parts of an effervescent couple constituted by a mixture of a pharmaceutically acceptable acid and alkalai which in contact with water will react to liberate carbon dioxide, the ratio be weight of the aspirin to the total weight of the composition being greater than 1:8.

3,887,701

ANTIBACTERIAL ORAL COMPOSITIONS CONTAINING PRESERVATIVE-ANTIOXIDANTS

Julius Harvey Nachtigal, Colonia, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 1, 1974, Ser. No. 411,726

Int. Cl. A61k *7/16*

U.S. Cl. 424—54 24 Claims

1. An oral preparation comprising a non-toxic bisbiguanido hexane compound as antibacterial agent in amount of from about 0.01% to about 5% by weight based on the free base thereof, a vehicle for said agent compatible therewith and as a stabilizing agent from about 0.01% to about 5% by weight of hydrogenated coumarin reducing agent.

3,887,702

COMPOSITION AND METHOD FOR TREATING FINGERNAILS AND TOENAILS

Mildred Baldwin, 1545 Archer Rd., Bronx, N.Y. 10462

Filed Aug. 30, 1973, Ser. No. 392,970

Int. Cl. A61k *7/04*

U.S. Cl. 424—61 6 Claims

1. A composition for improving the quality of fingernails and toenails consisting essentially of an effective amount of an oil chosen from the group consisting of soybean oil, sunflower oil, and combinations thereof comprising from 1 to 19 parts soybean oil and from 19 to 1 parts sunflower oil, and from 200 to 2800 international units of vitamin E per fluid ounce of oil.

3,887,703

MUCOPOLYSACCHARIDES, THEIR PREPARATION AND USE IN COSMETIC AND PHARMACEUTICAL COMPOSITIONS

Georges Manoussos, and Claudine Berrebi, both of Paris, France, assignors to Societe Anonyne dite: L'Oreal, Paris, France

Continuation-in-part of Ser. No. 132,182, April 7, 1971, abandoned, which is a continuation of Ser. No. 714,770, March 21, 1968, abandoned, and a continuation of Ser. No. 860,044, Sept. 22, 1969, abandoned. This application Feb. 26, 1973, Ser. No. 335,728

Claims priority, application Luxembourg, Sept. 28, 1968, 56945

Int. Cl.[2] A61K *27/00*

U.S. Cl. 424—95 38 Claims

1. A method for producing mucopolysaccharides from a material selected from the group consisting of cutaneous teguments, umbilical cords and mixtures thereof from the foetus of an animal selected from the group consisting of a cow and a sheep comprising under aseptic conditions:

a. grinding said material,

b. extracting said ground material with an ionic extraction solution having a pH between 1.5 and 9 and present in amounts of about 1–20 ml/g of said ground material, said ionic extraction solution being selected from the group consisting of

i. a 0.1–2.5 M solution of a neutral salt selected from the group consisting of sodium chloride and potassium chloride,

ii. a 0.1 M solution of an acid salt selected from the group consisting of sodium acid phosphate, potassium acid phosphate, disodium citrate, dipotassium citrate and mixtures thereof,

iii. a solution of hydrochloric acid having a pH of about 1.5 and

iv. a 1N solution of sodium hydroxide,

c. digesting said extracted, ground material in the presence of a proteolytic enzyme selected from the group consisting of trypsin, ficin, pepsin, pronase, papain and pancreatin, said enzyme being present in amounts effective to digest said material, said digesting being continued until said material becomes fluid, thereby forming a broth,

d. adding to said broth a solvent selected from the group consisting of acetone, methanol, ethanol and isopropanol in amounts effective to precipitate said mucopolysaccharides therefrom,

e. separating said precipitated mucopolysaccharides by filtration, decantation or centrifugation,

f. washing said separated mucopolysaccharides, and

g. drying said mucopolysaccharides thereby providing mucopolysaccharides in the form of a white solid, soluble in water and physiological serum solution and having a molecular weight ranging between about 5,000–2,500,000.

3,887,704

AQUEOUS ZINC SOLUTIONS FOR PHYSIOLOGICAL USE

Joseph Lichtenstein, 101 Devon Rd., Colonia, N.J. 07067

Filed Mar. 12, 1974, Ser. No. 450,390
Int. Cl.[2] A61K 27/00
U.S. Cl. 424—145 11 Claims

1. A composition for use in physiological administration comprising an aqueous solution having a pH within the range of from 5.0 to 8.5 of a water-soluble zinc salt in a proportion sufficient to provide a physiologically active zinc ion concentration, at least one other physiologically active ingredient selected from the group consisting of water-soluble phosphates, soaps, fatty acids, proteins and protein hydrolysates in a proportion normally tending to insolubilize said zinc ions, and a neutralized salt which is water-soluble at a pH within the range of from 5.0 to 8 5 selected from the group consisting of water-soluble alkali metal, alkaline earth metal, alkanolamine, amine, and quaternary ammonium salts of an acid whose zinc salt is water-soluble at a pH within the range of from 5.0 to 8.5, the weight ratio of said neutralized salt to said zinc salt being within the range of from about 0.1 to about 40, whereby the insolubilization of said zinc ions by said other physiologically active ingredient is inhibited by said neutralized salt.

3,887,705

MEDICAMENTS INTENDED FOR THE PREVENTION AND TREATMENT OF CAPILLARY-VENOUS DEFICIENCIES

Hubert Serre, Mazamet, and Jean Rey, Castres, both of France, assignors to Pierre Fabre S.A., Paris, France

Filed May 17, 1973, Ser. No. 361,020
Claims priority, application France, May 17, 1972, 72.17754
Int. Cl.[2] A61K 27/00
U.S. Cl. 424—180 12 Claims

1. Pharmaceutical composition useful in the prevention and treatment of circulatory disturbances comprising in effective amounts

a. dihydroergotamine or a pharmaceutically acceptable salt thereof,

b. at least one vitamin P compound, and

c. ascorbic acid (vitamin C) in a form useful in medicaments,

wherein said components (a), (b) and (c) are present in amounts so as to provide the components in a proportion by weight of about 2 parts of (a), 10–150 parts of (b), and 30–350 parts of (c).

3,887,706

N6-(3-CHLOROBUTEN-2-YL)-ADENOSINES AS ANTI-INFLAMMATORY AGENTS

Helmut Vorbrüggen, Berlin, Germany, assignor to Schering Aktiengesellschaft, Berlin, Germany

Division of Ser. No. 94,624, Dec. 2, 1970, Pat. No. 3,766,168.
This application July 23, 1973, Ser. No. 381,600
Claims priority, application Germany, Dec. 12, 1969, 1962387
Int. Cl. A61k 27/00
U.S. Cl. 424—180 2 Claims

1. A process for the treatment of inflammatory conditions which comprises administering to a patient an effective anti-inflammatory amount of a pharmaceutical anti-inflammatory preparation of a compound selected from the group consisting of N^6-(3-chloro-cis-buten-2-yl)-adenosine and N^6-(3-chloro-trans-buten-2-yl)-adenosine and admixed with a pharmaceutically acceptable carrier.

3,887,707

ANTI-ARTHRITIC COMPOSITIONS COMPRISING AN S-HOSPHINE OR PHOSPHITE GOLD THIO-CYANATE AND METHODS OF PRODUCING ANTI-ARTHRITIC ACTIVITY

Blaine M. Sutton, Hatboro; Donald T. Walz, Drexel Hill, and Joseph Weinstock, Phoenixville, all of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed July 23, 1973, Ser. No. 381,831
Int. Cl. A61k 27/00
U.S. Cl. 424—210 8 Claims

5. The method of producing anti-arthritic activity which comprises administering orally to an animal in need of said activity in an amount sufficient to produce said activity an S-phosphine or phosphite gold thiocyanate of the formula:

$$(R)_3P \rightarrow AuSCN$$

in which R is lower alkyl, lower alkoxy, phenyl or phenoxy, each alkyl or alkoxy having from 1 to 3 carbon atoms.

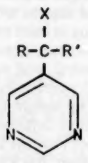
3,887,708

ALPHA, ALPHA-DISUBSTITUTED-5-PYRIMIDINEMETHANES USED AS FUNGICIDES

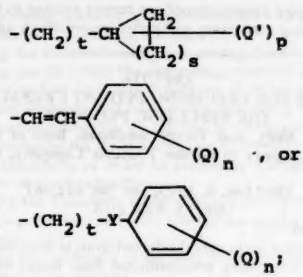
Harold M. Taylor; James D. Davenport, and Ronald E. Hackler, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 234,339, March 13, 1972, Pat. No. 3,818,009, which is a continuation-in-part of Ser. No. 888,949, Dec. 29, 1969, abandoned, which is a continuation-n-part of Ser. No. 829,844, May 7, 1969, abandoned, which is a continuation-in-part of Ser. No. 685,315, Nov. 24, 1967, abandoned, which is a continuation-in-part of Ser. No. 634,074, April 27, 1967, abandoned. This application Dec. 20, 1972, Ser. No. 316,967
Int. Cl. A01n 9/12, 9/20
U.S. Cl. 424—251 12 Claims

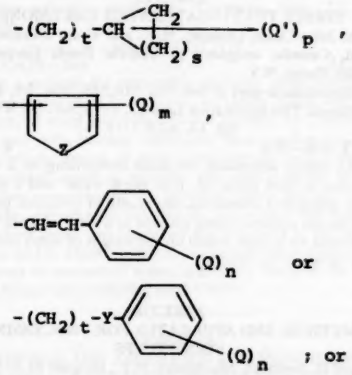
1. A method of controlling phytopathogenic fungi of plants which comprises contacting the fungi with a fungicidally-effective but non-phytotoxic amount of one or more compounds of the formula



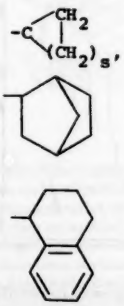
wherein
X is
hydrogen,
hydroxy,
C_1–C_4 alkanoyloxy,
$N(R'')_2$,
C_1–C_3 alkyl,
C_1–C_3 alkoxy,
C_1–C_3 alkylthio,
halo,
cyano,
anilino,
hydroxylamino,
imidazolylthio,
furylthio, or
thienylthio;
R is
C_1–C_{13} alkyl,
C_2–C_{12} alkenyl,

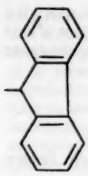


R′ is
C_7–C_{12} alkyl,
C_7–C_{12} alkenyl,
norbornen-2-yl,
2-norbornyl,
adamantyl,

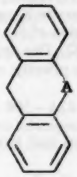


when X is hydrogen or hydroxy, R and R′ taken together with the carbon atom to which they are attached form a ring of the formula





, or



Q is C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, halo, hydroxy, trifluoromethyl, C_1–C_4 alkylsulfonyl, nitro, or di(C_1–C_4 alkyl)amino, or two Q's attached to adjacent carbon atoms of a benzene ring form a methylenedioxy group;
Q′ is C_1–C_4 alkyl or methoxy;
Y is oxygen, sulfur, or a carbon-to-carbon bond;
Z is oxygen or sulfur;
A is oxygen, sulfur, CH_2, CH_2—CH_2, or CH=CH;
R″ is hydrogen, C_1–C_4 alkyl, or C_1–C_4 alkanoyl;
n is 0 to 5;
m is 0 to 2;
p is 0 to 3;
s is 1 to 6; and
t is 0 to 5,
or the nonphytotoxic acid addition salts thereof.

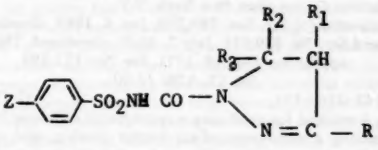
3,887,709

2-PYRAZOLINE-1-CARBOXAMIDE SULFONAMIDE DERIVATIVES USEFUL AS HYPOGLYCEMIC AGENTS

Zdzislaw Brzozowski, 9 m 1 Sniadeckich Str., Gdansk-Wrzeszcz; Stefan Angielski, 10 m 1 Hoene-Wronskiego Str., Gdansk-Wrzeszcz, and Czeslaw Wójcikowski, 86 c m 95 Pomorska Str., Gdansk-Oliwa, all of Poland

Division of Ser. No. 181,009, Sept. 16, 1971, Pat. No. 3,780,058. This application Nov. 30, 1972, Ser. No. 310,916
Int. Cl. A61b *27/00*
U.S. Cl. 424—273 **2 Claims**

1. A method of treating a patient to produce hypoglycemic action, said method comprising administering to a patient an effective amount for producing hypoglycemic action of a compound having the formula:



in which Z is hydrogen, halogen or lower alkyl, and R, R_1, R_2, and R_3 each is hydrogen or lower alkyl.

3,887,710

SYNERGIZED CARBAMATE INSECTICIDE

Henry W. Shaver, New York; William Schmidt, Sea Cliff, and Murray W. Winicov, Flushing, all of N.Y., assignors to West Laboratories, Inc., Long Island City, N.Y.

Filed Apr. 19, 1972, Ser. No. 245,624
Int. Cl. A01n *9/20*
U.S. Cl. 424—300 **2 Claims**

1. An insecticidal composition for use against non-flying insect pests comprising the carbamate insecticide o-

isopropoxyphenyl methylcarbamate and a synergist which is a glycerol ester of C_8 to C_{22} fatty acids, the proportions of said synergist to said carbamate insecticide being within the range of about 0.5:1 to 2.5:1 on a weight basis.

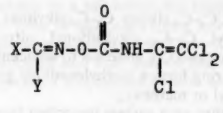
3,887,711

FUNGICIDAL CARBAMALDOXIMES

Jacques Perronnet, and Pierre Girault, both of Paris, France, assignors to Roussel Uclaf, Paris, France

Division of Ser. No. 408,744, Oct. 23, 1973, Pat. No. 3,836,582. This application June 26, 1974, Ser. No. 483,290
Claims priority, application France, Nov. 6, 1972, 72.39141
Int. Cl. A01n 9/20
U.S. Cl. 424—300 3 Claims

1. A fungicidal composition comprising an effective amount of a compound of the formula



wherein Y is selected from the group consisting of hydrogen, chlorine and bromine and X is selected from the group consisting of phenyl optionally substituted with at least one member selected from the group consisting of halogen, cyano, —NO_2, alkyl of 1 to 6 carbon atoms and alkoxy of 1 to 6 carbon atoms; and a carrier.

3,887,712

ORAL HYGIENE PRODUCTS

Myron J. Lover, Mountainside, and Joseph P. Speranza, Clark, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed June 15, 1973, Ser. No. 370,481
Int. Cl. A61k 7/16
U.S. Cl. 424—326 1 Claim

1. A liquid oral hygiene composition for use in diluted form in an oral irrigation device for the prevention of dental plaque, calculus, gingivitis, caries and related periodontal disease comprising as active ingredient, alexidine dihydrofluoride in concentration 1 percent by weight.

3,887,713

METHOD FOR PRODUCING FLEXIBLE CASINGS AND THE CASINGS OBTAINED THEREFROM

Jerome Jordan Michael Rasmussen, South Stickney Township, and David Voo, Park Forest, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. Nos. 789,350, Jan. 6, 1969, abandoned, and Ser. No. 839,651, July 7, 1969, abandoned. This application Aug. 19, 1971, Ser. No. 173,250
Int. Cl. A22c 13/00
U.S. Cl. 426—135 17 Claims

1. A method for producing a regenerated cellulosic casing containing a moistureproof-gas barrier coating, said casing exhibiting improved flexibility and antiblock characteristics, the method including the steps of:

a. incorporating into a viscose solution a softening-antiblock additive in an amount of from about 2.5 to 14 percent by weight based upon the dry weight of the cellulose in the viscose solution, said softening-antiblock additive being a fully esterified fatty acid ester of a polyhydric alcohol added to said viscose solution in an aqueous emulsion thereof;

b. extruding the viscose solution containing said softening-antiblock additive to form a tubular configuration;

c. coagulating and regenerating the cellulose in the tubular configuration until a tubular cellulosic casing is obtained having the softening-antiblock additive incorporated in the wall thereof; and,

d. applying a moistureproof-gas barrier coating to the tubular casing containing said softening-antiblock additive.

3,887,714

PROCESS FOR PREPARING INSTANT CEREALS AND THE RESULTING PRODUCT

Vincent J. Kelly, and Wayne Smalligan, both of Fremont, Mich., assignors to Gerber Products Company, Fremont, Mich.

Filed Dec. 6, 1973, Ser. No. 422,481
Int. Cl. A23l 1/18
U.S. Cl. 426—72 7 Claims

1. An instant grain cereal selected from at least one of oats or wheat, comprising pregelatinized base flakes and quick cooking cereal flakes in a weight ratio of 1:1–5 as a dry mixture, said flakes being in a size of about 0.05 to about 0.25 inch cross section,

wherein said pregelatinized base flakes are prepared by drying and flaking a slurry comprised of 80 to 95 weight percent of cereal flour and 2 to 10 weight percent mineral supplementation, with from 2.5 to 10.0 times by weight of water, said slurry being heated to a temperature in the range of 140° to 230° F.

3,887,715

EDIBLE POLYUNSATURATED EMULSIONS

Charles John Cante, Ossining, N.Y., and Victor Moreno, Montreal, Canada, assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 310,283, Nov. 29, 1972, abandoned. This application June 13, 1974, Ser. No. 479,022
Int. Cl. A23l 1/14
U.S. Cl. 426—570 6 Claims

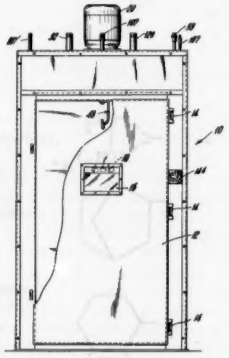
1. An edible whippable emulsion comprising on a volume basis one to four parts oil, four parts water and a proteinaceous emulsifier consisting essentially of proteose peptone, the proteose peptone being present at a level of from 0.01 to 2.0 percent by weight, based on the weight of water contained in the oil-water emulsion.

3,887,716

METHOD AND APPARATUS FOR PROCESSING FOODSTUFFS

Bernard H. Seelbach, Staatsburg, N.Y., assignor to K. C. Seelbach Co. Inc., Rhinebeck, N.Y.

Division of Ser. No. 231,566, March 3, 1972, Pat. No. 3,747,513. This application Apr. 23, 1973, Ser. No. 353,816
Int. Cl. A23b 1/04
U.S. Cl. 426—231 7 Claims



1. A method of processing foodstuffs in an apparatus includ-

ing a processing chamber in communication with an air distribution chamber, comrising the steps of:

placing the foodstuffs in the processing chamber;

heating the air within the processing chamber and recirculating said air from said processing chamber to the distribution chamber and back to the processing chamber;

introducing outside dry air into the processing chamber and recirculating the air at a high rate of speed to dehumidify the foodstuffs in order to accelerate the setting of the color of the foodstuffs;

smoking the foodstuffs by introducing smoke into the processing chamber and recirculating the air at a slow rate of speed;

cooking the foodstuffs to the desired temperature to inhibit bacterial growth; and

removing said foodstuffs from the processing chamber.

3,887,717
PROCESS FOR THE EXTRACTION OF PROTEINS, OTHER NITROGENOUS SUBSTANCES AND LIPIDS FROM BONES

Gottfried Pfeiffer, Eching; Robert Weilhauser, Dachau, and Hartmut Gehra, Furstenfeldbruck, all of Germany, assignors to Herta KG Karl Schweisfurth, Germany

Filed Nov. 21, 1972, Ser. No. 308,439

Claims priority, application Germany, Nov. 22, 1971, 2157850

Int. Cl. A23j *1/10*

U.S. Cl. 426—264 **11 Claims**

1. In a process for extracting proteins, other nitrogenous substances and lipids from bones, including bones with adherent flesh, of warm and cold blooded animals, by comminuting the bones with cooling, supplying water and/or ice to the bones before, during or after communition and centrifuging the resulting aqueous mixture, the improvement in which comprises comminuting the bones so finely that the proteins and other nitrogenous substances, other than the remaining connective tissue, are dissolved and disposed in the aqueous mixture and in which the bones are mixed with a total quantity of at least 60 percent of water and/or ice based of the weight of the bones with adhering flesh.

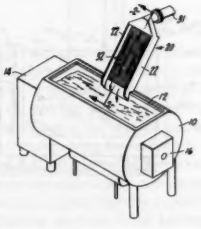
3,887,718
METHOD AND APPARATUS FOR PROCESSING COTTAGE CHEESE CURD AND LIKE FOODS

Horace Hinds, Jr., Mountain View, Calif., assignor to Grace Machinery Company Incorporated, Santa Rosa, Calif.

Filed Aug. 19, 1972, Ser. No. 173,022

Int. Cl. A23c *21/00*

U.S. Cl. 426—491 **20 Claims**



1. In an improved method for rapidly and efficiently separating intermixed liquids and soft particulate foods, with minimum alteration in the characteristics of the separated components, the steps of providing an inclined separation zone in the form of a plurality of spaced apart transverse rods having substantially planar conveyance surfaces, arranging said conveyance surfaces in substantially coplanar relation wherein each individual conveyance surface is inclined at a slight angle with respect to a direction of conveyance across said separation zone, each of said conveyance surfaces being at a shallow obtuse angle with respect to said direction of conveyance so as to arrest the movement of materials flowing thereover, introducing a feed of intermixed liquid and soft particulate food to said separation zone along said direction of conveyance to thereby cause the soft food praticles to move in gently cascading, arrested fashion along said conveyance surfaces and the liquid to pass through and between said conveyance surfaces, whereby the liquid and soft particulate food materials are rapidly and substantially separated, and independently collecting the separated liquid and soft food particles for further processing.

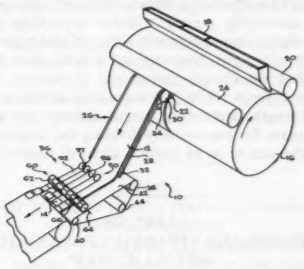
3,887,719
METHOD AND APPARATUS FOR HANDLING PROCESS CHEESE SPREAD

Roland E. Miller, Orangeville, Ill., assignor to Kraftco Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 96,766, Dec. 10, 1970, abandoned. This application Apr. 23, 1973, Ser. No. 353,789

Int. Cl. A23c *19/02*

U.S. Cl. 426—517 **6 Claims**



1. A method of handling a process cheese spread containing from about 44% to about 60% moisture, which when formed into a sheet has low tensile strength, for division thereof into slices, comprising the steps of forming the process cheese spread into a sheet by distributing the cheese spread in a flowable state onto a top portion of a rotating chill roll, separating a sheet of the cheese spread from the chill roll at another top portion thereof after it has remained on the chill roll for a period of time less than the period for one revolution but more than the period of three-quarters of one revolution of the roll, guiding said sheet upwardly between a guide roll and a first conveyor means, substantially reversing the direction of travel of said sheet, conveying said sheet of cheese spread downwardly and away from the chill roll on said first conveying means, supporting the cheese spread across its width and along its length substantially from beneath while it is being conveyed on said first conveyor means, transferring the cheese spread from said first conveying means to a second substantially horizontal conveying means disposed below said first conveying means, supporting the cheese spread substantially across its width and along its length during transfer from said first conveying means to said second conveying means, said substantial support during transfer being effected by tapered bar means located at the terminus of said first conveyor means adjacent said second conveyor means, conveying the cheese spread while supporting it across its width and along its length substantially from beneath in a direction away from the chill roll on said second conveying means, slitting the cheese spread into a plurality of adjacent longitudinal strips while the cheese spread is supported across its width and along its length after removal from said chill roll, and cutting the longitudinal cheese spread strips tranversely so as to provide slices of desired length and width, said cutting occurring while

the cheese spread is conveyed on said second conveying means.

4. Apparatus for handling a process cheese spread containing from about 44% to about 60% moisture, which when formed into a sheet has low tensile strength, for division thereof into slices, comprising a chill roll adapted to receive the process cheese spread in a flowable state and to rotate with the cheese spread thereupon until the cheese spread has set into a sheet, means for separating the cheese spread sheet from near the top of the chill roll, said separating means comprising a doctor blade disposed adjacent the chill roll along the length thereof and adapted to remove the cheese spread sheet from the chill roll and a rotating member positioned adjacent thereto and having its axis parallel to the axis of the chill roll and being above and adjacent a first conveyor means and adapted to guide the cheese spread sheet from the chill roll onto said first conveying means, first conveying means adjacent the roll for conveying the cheese spread in a direction downwardly and away from the separating means, second substantially horizontal conveying means disposed below said first conveying means for conveying the cheese spread in a direction away from the chill roll, both conveying means supporting the cheese spread across its width and along its length substantially throughout the conveying, said first conveying means including tapered bar means at the lower end thereof for effecting a transfer of the cheese spread to said second conveying means without separation or tearing thereof, slitting means adjacent either of said conveyor means at a point where the cheese spread is in the form of the sheet for dividing the cheese spread into a plurality of adjacent longitudinal strips while it is supported across its width and along its length, and cutting means adjacent the second conveying means for transversely dividing the longitudinal strips carried thereon so as to provide slices of desired length and width.

3,887,720

METHOD AND APPARATUS FOR COATING A METALLIC STRIP

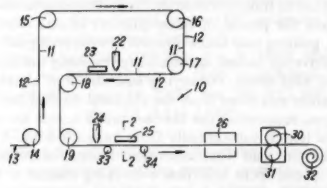
Albert Edward Jackson, Mold, Wales, assignor to British Steel Corporation, London, England

Continuation of Ser. No. 263,617, June 16, 1972, abandoned. This application Feb. 1, 1974, Ser. No. 438,631

Claims priority, application United Kingdom, June 29, 1971, 30433/71

Int. Cl. B05b *5/02*; **B44d** *1/092*, *1/44*

U.S. Cl. 427—32 **11 Claims**



1. In a method of coating a metallic strip comprising:

wetting a first surface of the strip, passing the wetted first surface adjacent to and at a predetermined constant spacing, throughout its width, from a first electrostatically charged grid supplying a metallic powder to the wetted first surface and applying the metallic powder electrostatically to said first surface to provide said surface with a coating of the metallic powder;

wetting a second surface of the strip which is opposite to the said first portion thereof, passing the wetted second surface adjacent to a second electrostatically charged grid, supplying a metallic powder to the wetted second surface and applying the metallic powder electrostatically to said second surface to provide said surface with a coating of the metallic powder; and

drying the wetted coatings on the first and second surfaces and effecting firm adherence of dry coatings to both said surfaces;

the improvement comprising at least one smooth surfaced cylindrical support roll disposed adjacent to and below the second grid to maintain a predetermined constant spacing between the metallic strip and the grid, throughout its width, from said second grid while passing the wetted coating on the first surface of the strip in direct contact with said support roll, the strip being a relatively wide strip of at least about 48 inches, and each of said grids being disposed parallel to and spaced from the respective surface throughout the whole width of the strip by a constant distance in the range of 1.0 to 1.5 inches.

8. In an apparatus for coating a relatively wide metallic strip of at least about 48 inches comprising first and second wetting means for respectively wetting first and second opposite surfaces of the strip, first and second electrostatically charged grids by means of which the first and second wetted surfaces may be respectively electrostatically coated with metallic powder, each grid being disposed parallel to and spaced from the respective surface throughout the whole width of the strip by a constant distance in the range of 1.0 to 1.5 inches, means for moving the strip sequentially past the first and second grids so that each of the first and second surfaces of the strip passes adjacent to and at a predetermined constant spacing, throughout its width, from the respective grid, means for drying the wetted coatings on the first and second surfaces and effecting firm adherence of the coatings to said surface,

the improvement comprising including at least one smooth surfaced cylindrical support roll disposed adjacent to and beneath the second grid and over which, in operation, the wetted coating on the first surface passes.

3,887,721

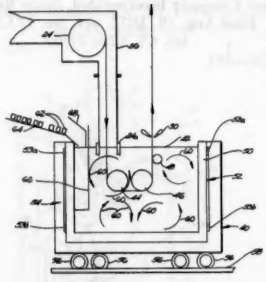
METALLIC COATING METHOD

Roman A. Schwieterman, Middletown, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

Filed Dec. 20, 1972, Ser. No. 316,826

Int. Cl. B05c *3/0*; **B44d** *1/20*

U.S. Cl. 427—45 **5 Claims**



1. In a hot dip metallic coating method including the steps of thoroughly cleaning the surface of a ferrous base metal strand to prepare said surface to be wet by the coating metal, passing said cleaned base metal strand into a bath of molten coating metal, withdrawing said strand from said bath in an upward path of travel whereby a quantity of said molten coating metal will be carried from said bath by said strand, finishing said molten metal adhering to said strand, and solidifying said molten coating; the improved steps of:

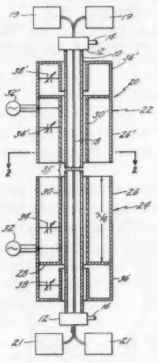
a. providing a nonconductive coreless induction coating pot for containing said bath of molten coating metal;
b. providing a primary coil within the side walls of said pot; and
c. supplying power to the primary coil of said coreless induction pot whereby to induce heavy secondary currents in the coating metal in said pot which are converted into heat by the resistance of said coating metal, said induced secondary currents serving to continuously agitate the molten coating metal whereby to help provide a bright bath surface where said strand exists from said bath and to substantially eliminate the accumulation of oxides and dross on the bottom of said pot and to minimize the accumulation of oxides and dross on the walls of said pot.

3,887,722

METHOD FOR PRODUCING A PLURALITY OF FILAMENTS IN A RADIO FREQUENCY REACTOR

Frank C. Douglas, Granby; Francis S. Galasso, Manchester, and James Y. Whittier, South Glastonbury, all of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Aug. 31, 1973, Ser. No. 393,697
Int. Cl. C23c *11/00*
U.S. Cl. 427—46 **10 Claims**



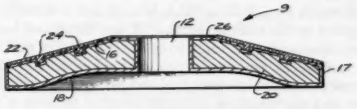
1. A process for simultaneously producing a plurality of filaments using a single electrical heating unit by vapor depositing material from a material containing decomposable gas onto a plurality of moving wires heated by electrical power dissipation therein wherein the impedance of the wire changes during deposition, comprising the steps of:
passing said wires through a single coaxial cavity coupler means to electromagnetically couple said wires to radio frequency source means thereby exposing said wires to an axially oscillating electric field having a density sufficiently high to heat the wires and cause deposition of said material thereon, said coupler means including wall means forming a channel aligned with the axis of said wires;
positioning each of said wires within said channel at the same nominal distance from adjacent affecting walls of said channel, and;
maintaining the position of each wire within 2 percent of said nominal distance from said affecting walls.

3,887,723

METHOD OF FABRICATION OF COMPOSITE ANODE FOR ROTATING-ANODE X-RAY TUBES

Richard B. Kaplan, 4151 Dundee Dr., Los Angeles, Calif. 90027; Sebastian Gonnella, 13688 Chase St., Pacoima, Calif. 91331, and Walter M. Abrams, 17333 Victory Blvd., Van Nuys, Calif. 91406

Filed Mar. 22, 1972, Ser. No. 236,898
Int. Cl. B44d *1/18*
U.S. Cl. 427—58 **18 Claims**



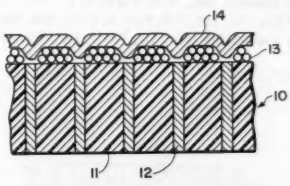
4. The method of fabricating a composite anode for a rotating-anode x-ray tube, comprising the steps of:
providing a substrate disk of a first refractory material, said disk having an axis, a substantially frusto-conical upper surface and a lower surface; said upper and lower surface, each being substantially symmetric about said axis;
scoring at least a portion of the sloped region of said upper surface; and
applying to at least a part of said scored, sloped region, a coating comprising a second material differing from said first material, said second material having the ability to emit x-rays in response to electron bombardment, at least a portion of said coating caused to extend into said scoring.

3,887,724

METHOD OF MAKING HIGH CONTRAST FIBER OPTIC PHOSPHOR SCREEN

Nicholas A. Diakides, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 308,886, Nov. 22, 1972, abandoned. This application Dec. 6, 1973, Ser. No. 422,457
Int. Cl. B44d *1/16*
U.S. Cl. 427—64 **2 Claims**



1. A method of producing a high contrast fiber optic arrayed phosphor screen comprising the steps of:
immersing in a photosensitive solution a fiber optic substrate composed of a plurality of fiber optic core elements surrounded by cladding material;
adding phosphor to said solution and allowing the phosphor to settle onto the surface of said substrate to a desired thickness;
directing ultraviolet radiation from the side opposite the phosphor coated surface of the substrate, said radiation passing through said fiber optic core elements to the phosphor layer; and
removing the soft phosphor which was not exposed to the ultraviolet radiation and which remains over the cladding thereby forming said arrayed phosphor screen.

3,887,725

PROCESS FOR IMPROVING LUMEN MAINTENANCE OF CALCIUM HALOPHOSPHATE PHOSPHORS USED IN A FLUORESCENT LAMP

Albert O. Halstead, Jr., Waverly, and Donald A. Hebbard, Genoa, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 4, 1972, Ser. No. 311,665
Int. Cl. H01j *61/35, 61/42*
U.S. Cl. 427—67 2 Claims

1. In a process of fabricating a fluorescent lamp in which a slurry of a calcium halophosphate phosphor having the general formula $Ca_{10}(F,Cl)_2(PO_4)_6$:Mn,Sb and a suitable lacquer is applied to the interior surface of said lamp and baked, the improvement wherein prior to the application of said slurry to said surface, an amount of zinc orthophosphate sufficient to increase lumen maintenance of said phosphor is added to said slurry and the resultant slurry is blended to form a substantially homogenous mixture.

3,887,726

METHOD OF CHEMICAL VAPOR DEPOSITION TO PROVIDE SILICON DIOXIDE FILMS WITH REDUCED SURFACE STATE CHARGE ON SEMICONDUCTOR SUBSTRATES

Robert L. Bratter, Wappinger Falls, and Arun K. Gaind, Fishkill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 29, 1973, Ser. No. 375,297
Int. Cl. B44d *1/18*
U.S. Cl. 427—95 9 Claims

1. In the method of forming silicon dioxide films on silicon substrates by a chemical-vapor deposition reaction of a mixture of an oxidizing agent and $SiH_nCl_{(4-n)}$, where n is an integer of from 0 to 4, to deposit silicon dioxide films displaying a maximum increase of 1×10^{11} charges/cm^2 in surface charge when subjected to bias-temperature test conditions of applied field of 2×10^6 V/cm for 30 minutes at 250°C, the improvement of

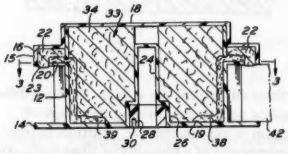
adding HCl from an external source to said reactants.

3,887,727

METHOD OF MAKING PRINTING RIBBON SPOOL

Walter Ploeger, Jr., North Bellmore, N.Y., and John W. H. Bishop, Montreal, Quebec, Canada, assignors to Controlled Printout Devices, Inc., New York, N.Y.

Division of Ser. No. 195,710, Nov. 4, 1971, Pat. No. 3,819,026.
This application Nov. 14, 1973, Ser. No. 415,579
Int. Cl. B41j *31/14*
U.S. Cl. 427—177 5 Claims



1. A method of replenishing ink in a printing ribbon comprising withdrawing ink from a sealed reservoir by capillary action using a wick of compressible material having one end communicating with said reservoir by way of an opening smaller in dimensions than the transverse dimensions of said wick in its uncompressed state, compressing said wick at said opening, transferring the ink from said reservoir by said wick to a deformable pad, transferring ink from the pad to a printing ribbon by contact between the pad and a side edge of the ribbon, and initiating said transfer of ink from said reservoir to said pad by flexing an exposed portion of said pad.

3,887,728

VINYLCHLORIDE-ALKYLENE COPOLYMER AND USES THEREFOR

Wolfgang Looman; Wolfgang Pungs, both of Troisdore; Egon Bierwirth, Porz-Urbach, and Robert Buning, Oftroisdorf Sieglar, all of Germany, assignors to Dynamit Nobel AG, Troisdorf, Germany

Continuation of Ser. No. 117,690, Nov. 18, 1970, abandoned.
This application Feb. 9, 1973, Ser. No. 330,920
Claims priority, application Germany, Nov. 18, 1969, 1946612; Nov. 18, 1969, 1957824
Int. Cl. B44d *1/094*
U.S. Cl. 427—185 5 Claims

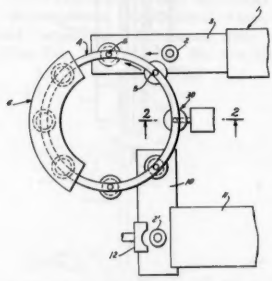
1. In the process of coating a substrate with a plasticizer-free vinyl chloride polymer coating by the use of a fluidized-bed of sinterable polymer particles; the improvement with comprises utilizing as coating composition a molding composition consisting essentially of 90 to 99.5 weight percent vinyl chloride and 0.5 to 10 weight percent ethylene or propylene having a K-value of 45 to 65 and having a grain size of about 0.04 to 0.5 mm.

3,887,729

METHOD FOR COATING GLASS CONTAINERS

Joseph C. Cavanagh, Bay Shores, N.Y., assignor to Midland Glass Company, Cliffwood, N.J.

Filed Nov. 15, 1973, Ser. No. 415,972
Int. Cl. B05b *5/02*; B44d *1/094*
U.S. Cl. 427—195 11 Claims



1. A method for applying a powdered synthetic resin coating to a glass container comprising:

a. attaching a first work holder to said container;

b. conducting said work holder, with said attached container, through a coating zone, so as to coat said container with said powdered synthetic resin;

c. removing said coated container from said first work holder;

d. attaching a second work holder to said coated container; and

e. conveying said second work holder with said attached, coated container through a curing zone to fuse said coating.

3,887,730
MICROPOROUS STYRENE POLYMERS AND METHOD OF MAKING SAME

Norman B. Rainer, and Peter Allen Wilson, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 21, 1972, Ser. No. 282,481
Int. Cl. B44d *1/09*; **A24d** *1/00*
U.S. Cl. 427—244 **12 Claims**

1. A process for preparing a microporous product which process comprises:

a. diluting a styrene polymer latex, said styrene polymer being non-film forming and comprising at least 80 percent styrene, with a water-soluble ether compatible with said polymer and having a boiling point above about 85°C, said ether being employed in an amount sufficient to form a dispersion containing from about 5 to about 30 weight percent of said polymer,

b. impregnating said dispersion into a fibrous material, and

c. heating the impregnated fibrous material to a temperature of from about 80°C to about 120°C, said temperature being lower than the boiling point of said ether, for about 1 minute to about 60 minutes.

3,887,731
CORROSION RESISTANT COATING SYSTEM FOR FERROUS METAL ARTICLES HAVING BRAZED JOINTS

Michael F. Dean; Hossein Borougerdi, and John A. Puchot, all of San Antonio, Tex., assignors to Chromalloy American Corporation, New York, N.Y.

Filed Apr. 23, 1973, Ser. No. 353,677
Int. Cl. C23c *9/00*
U.S. Cl. 427—258 **15 Claims**

1. A method of aluminizing a brazed stainless steel article characterized by at least one brazed joint, the braze of said joint being formed of a non-ferrous brazing alloy of melting point ranging from about 1125°F to 1925°F which comprises: selectively coating the non-ferrous braze of said stainless steel article with an adherent layer of nickel of at least about 0.0002 inch thick,

and thermally diffusing aluminum into the entire surface of said article including the selectively coated braze,

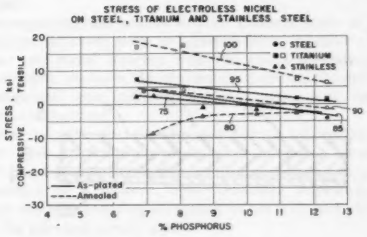
whereby a sacrificial coating comprising said aluminum is produced, the aluminum coating on the stainless steel surface being characterized by the presence of iron aluminide and the aluminum coating on said nickel-coated braze being chacterized by the presence of nickel aluminide.

3,887,732
STRESS CONTROLLED ELECTROLESS NICKEL DEPOSITS

Konrad Parker, Park Ridge, and Hasmukhlal M. Shah, Chicago, both of Ill., assignors to General American Transportation Corporation, Chicago, Ill.

Filed Oct. 1, 1970, Ser. No. 77,063
Int. Cl. C23c *1/10*
U.S. Cl. 427—380 **6 Claims**

1. A method of producing a nickel-phosphorus alloy coating having a predetermined and controlled residual stress in the range of from about +15 ksi tensile stress to about −17 ksi compressive stress therein and chemically deposited on a metal substrate selected from the group consisting of beryllium, aluminum, titanium, iron, nickel, copper and their alloys, said method comprising introducing the metal substrate into an aqueous bath of the nickel cation-hypophosphite anion type, the bath having a hypophosphite ion concentration expressed in moles per liter of from about 0.1 to about 0.5, maintaining the pH of the bath at a predetermined value in the range from about 3.5 to about 7 and the temperature of the bath at a predetermined value in the range from about 70°C. to about 95°C. to deposit on the metal substrate a nickel-phosphorus coating having a phosphorus content of a predetermined value in the range of between about 13 percent and about 3 percent, maintenance of the pH of the bath at the upper end of the pH range coupled with maintenance of the temperature of the bath at the lower end of the temperature range producing a coating having a phosphorus content at the lower end of the phosphorus range and maintenance of the pH of the bath at the lower end of the pH range coupled with maintenance of the temperature of the bath near the upper end of the temperature range producing a coating having a phosphorus content at the upper end of the phosphorus range, a coating having a phosphorus content near the lower end of

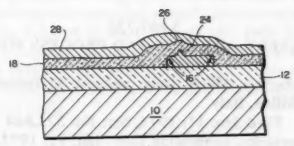


the phosphorus range tending to be in tensile stress and a coating having a phosphorus content near the upper end of the phosphorus range tending to be in compressive stress, contacting the metal substrate with the bath for a time period sufficient to deposit on the metal substrate a coating having a predetermined thickness of at least about one-tenth mil, removing the coated metal substrate from the bath and cooling the coated metal substrate to ambient temperatures, whereby to produce a metal substrate having chemically deposited thereon a nickel-phosphorus coating having a predetermined and controlled residual stress therein.

3,887,733
DOPED OXIDE REFLOW PROCESS

Donald L. Tolliver, Phoenix, and William E. Armstrong, Tempe, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Apr. 24, 1974, Ser. No. 463,631
Int. Cl. B44d *1/16*
U.S. Cl. 427—444 **7 Claims**

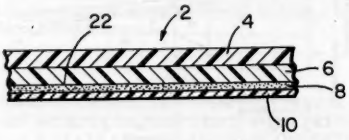


1. A process for altering the shape of a doped oxide layer on a substrate, which comprises:

contacting said doped oxide with a source of hydroxyl ions, and heating said doped oxide at least to its softening temperature while in contact with said source of hydroxyl

ions, and allowing said doped oxide to reflow until the desired alteration of the layer has taken place.

3,887,734
EMBOSSING TAPE
David J. Chazan, Berkeley, Calif., assignor to Dymo Industries, Inc., San Francisco, Calif.
Filed Oct. 29, 1973, Ser. No. 410,724
Int. Cl. B32b *27/08, 27/18, 27/30*
U.S. Cl. 428—40 16 Claims



1. An embossable sheet material comprising a rigid non-stress whitening plastic backing film and a base sheet of at least about 2mils in thickness of a stress-whitening elastomer modified poly(methyl methacrylate), having a tensile elongation of from about 25 to 80 percent of elongation at break and wherein said elastomeric modifier is bonded or mixed with said poly(methyl methacrylate) and said elastomeric modifier is an acrylate polymer having at least about 50 monomer percent of an alkyl acrylate, and said alkyl group is of from about 1 to 6 carbon atoms.

6. An embossing tape for use in machines of the type impressing onto the tape alpha-numeric symbols comprising:

a transparent stress-whitening elastomer modified poly(-methyl methacrylate) film of from about 2 to 6 mils thickness, having a tensile elongation at break of from about 25 to 80 percent said elastomeric modifier is an acrylate polymer having at least about 50 monomer percent of an alkyl acrylate, and said alkyl group is of from 1 to 6 carbon atoms, a rigid non-stress whitening plastic film affixed to said base;

an adhesive coating affixed to the exposed side of said rigid plastic film; and

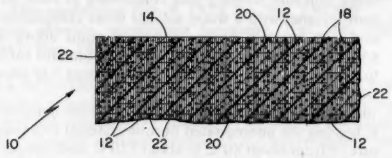
a protective film adhered to said adhesive coating.

3,887,735
UPHOLSTERY ARTICLES AND PROCESS FOR THEIR MANUFACTURE
Cesare Laberinti, Milan, Italy, assignor to Industrie Pirelli, S.p.A., Milan, Italy
Filed Jan. 11, 1973, Ser. No. 322,844
Claims priority, application Italy, Jan. 11, 1972, 19202/72
Int. Cl. B32b *3/26*
U.S. Cl. 428—71 7 Claims

1. In an article of upholstery molded in expanded polyurethane comprising an inner core of expanded polyurethane and a cover comprising a microporous polyurethane skin chemically bonded to said inner core,

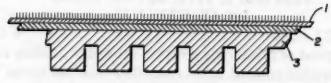
the improvement which comprises at least part of the surface of the microporous skin being covered by a very thin top coat of pigmented compact polyurethane, less than 0.05 mm thick, joined directly to the skin by a strong chemical bond, and having a slip coefficient of at least 20° (UNI 4818 Standard).

3,887,736
SYNTHETIC END GRAIN BLOCK DEFINING A WEAR SURFACE
Ernest R. Kaswell, Newton, Mass., assignor to Fabric Research Laboratories, Dedham, Mass.
Filed Sept. 7, 1973, Ser. No. 395,352
Int. Cl. B32b *5/02*; E04f *13/18, 15/10*
U.S. Cl. 428—87 13 Claims



1. A synthetic end grain block of the type adapted to be abutted with similar blocks to define a working surface and having a top surface adapted to define a portion of said working surface; a bottom surface parallel to and spaced from said top surface; a plurality of wear fibers extending within said block substantially perpendicular to said top and bottom surfaces; a plurality of other fibres extending other than generally perpendicular to said top surface and said bottom surface and interconnecting said wear fibres; and an organic plastic material extending substantially throughout said block and bonding said wear fibres together, ends of said wear fibres defining at least a part of said top surface, said wear fibres being at least 40 weight percent of said block, and at least 80% of all fibres within said block extending generally parallel to each other and perpendicular to said top surface and said bottom surface.

3,887,737
LAMINATE WITH FLOCKED FIBER PILE
Samuel Paul Baxter, London, England, and Keith Marchant, Newport, Wales, assignors to Monsanto Chemicals Limited, London, England
Filed June 27, 1972, Ser. No. 266,844
Int. Cl. D04h *11/00*
U.S. Cl. 428—90 5 Claims



1. A laminar structure for use as a surface covering comprising: a non-woven fabric sheet of continuous filaments wherein said sheet has a thickness of from 0.1 to 0.4 mm and a weight of 0.5 to 4 ounces per square yard, a pile of flocked fibers secured to one face of said fabric sheet by an adhesive, a foamed sheet of polyolefin resin selected from the group consisting of polyethylene and polypropylene resins bonded to the face of said fabric sheet opposite to that on which said flocked fibers are secured.

3,887,738

CARPET BACKSIZED WITH HOT MELT ADHESIVE AND METHOD

David D. Taft, Minneapolis, and Terry H. Shepler, St. Paul, both of Minn., assignors to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 149,843, June 3, 1971, Pat. No. 3,758,431, which is a continuation-in-part of Ser. No. 121,150, March 4, 1971, abandoned. This application May 15, 1973, Ser. No. 360,616The portion of the term of this patent subsequent to Sept. 11, 1990, has been disclaimed.

Int. Cl. D03d *27/00;* D04h *11/00*

U.S. Cl. 428—95 6 Claims

1. A process for backsizing a tufted carpet having a primary textile backing and non-woven tufts of synthetic fibers protruding therefrom which comprises:

a. heating to about 160° F. to about 375° F. a hot melt coating composition consisting essentially of:

1. copolymer of ethylene and unsaturated ester monomer selected from the group consisting of vinyl acetate, alkyl arcylate wherein the alkyl group contains 1 – 18 carbon atoms, and mixtures thereof, containing from 40 – 85% by weight of ethylene and from 15 – 60% by weight of said unstaturated ester monomer;
2. ester of rosin and polyhydric alcohol wherein the ester has an acid value between about 5 and about 40, and melting point range between 75° and 140° C.; and
3. ester of polyhydric alcohol and dimer and/or trimer or mixture thereof, of ethylenically unsaturated monocarboxylic fatty acid having 16 – 22 carbon atoms, wherein said ester has an acid value of 6 to 40;

b. applying a uniform coating in an amount from about 6 to 40 ounces per square yard of said composition in a molten state to the back side of said carpet at a coating station while moving said carpet past said coating station at a speed of from about 15to 80 feet per minute; and

c. thereafter solidifying said coating by cooling it below its melting point.

3,887,739

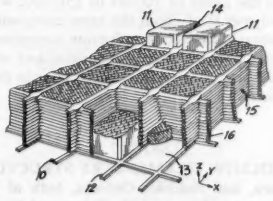
HONEYCOMB STRUCTURES

Robert V. Kromrey, Fair Oaks, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Division of Ser. No. 875,433, Nov. 10, 1969, Pat. No. 3,694,284, which is a continuation-in-part of Ser. No. 648,447, June 23, 1967, Pat. No. 3,617,416. This application June 21, 1971, Ser. No. 155,215

Int. Cl. B32b *3/12*

U.S. Cl. 428—112 8 Claims



1. A honeycomb structure comprising: a body having a plurality of open cells and means defining a number of walls surrounding said cells to provide a honeycomb configuration therefor, said means including a plurality of rovings high modulus fibrous arranged in stacked, intersecting relationship to each other, the portion of each roving at its intersections with adjacent rovings being flattened into chamfered areas so as to have a greater area then the portions of the roving between the intersections; and resin impregnated in said rovings throughout their lengths for bonding the overlapped rovings together.

3,887,740

PROCESS FOR DEPOSITING OXIDE COATINGS

Gordon F. Foster, Campbell; Helmuth E. Meissner, and Janice L. Stiles, both of Painted Post, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 1, 1972, Ser. No. 249,353

Int. Cl. B44d *1/44*

U.S. Cl. 428—116 6 Claims

1. A process for providing a catalyst on a uniform, tightly-adherent, high-surface-area oxide catalyst support coating deposited on the porous interior channel walls of a refractory monolithic support structure of the honeycomb type which comprises:

a. impregnating the porous interior channel walls of the support structure with an aqueous ionic solution of at least one metal selected from the group consisting of aluminum, titanium, tin, zirconium, thorium, chromium, manganese, iron, gallium, niobium, magnesium, tantalum, and hafnium;

b. contacting the thus-impregnated porous support structure with ammonia or an aqueous ammonia alkaline solution to cause the in situ precipitation on the support structure of a uniform, tightly-adherent, high-surface area coating consisting essentially of the hydrated oxide of the selected metals; and

c. depositing a noble metal catalyst on the high-surface-area coating.

3,887,741

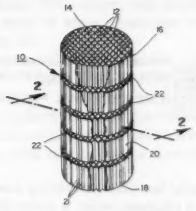
THIN-WALLED HONEYCOMBED SUBSTRATE WITH AXIAL DISCONTINUITIES IN THE PERIPHERY

Thomas J. Dwyer, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Aug. 13, 1973, Ser. No. 387,774

Int. Cl. B01j *9/00;* B29f *27/00;* B32b *3/12*

U.S. Cl. 428—188 24 Claims



1. A thermally shock resistant honeycombed structure comprising a plurality of thin walls forming open-ended cells of substantially polygonal, straight-sided cross-section and having axes extending from one end of said structure to the other end, said thin walls of at least 70% of said cells in a layer adjacent the periphery having an axial discontinuity in at least one location between said one end and said other end, said cells located centrally of said layer having substantially axially continuous cell walls.

3,887,742

COPY RESISTANT DOCUMENTS

Richard E. Reinnagel, 60 East Jerge Dr., Elma, N.Y. 14059

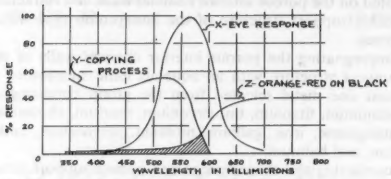
Filed Apr. 13, 1972, Ser. No. 243,743

Int. Cl. B42d *15/00;* B44d *1/44;* D21h *5/10*

U.S. Cl. 428—211 6 Claims

1. A sheet of material adapted to have graphical information applied thereto which can be detected by the retina of human eyes having typical spectral responses in the range of substantially 425 to 675 millimicrons, but which cannot be detected by the detectors of copying machines having spectral responses typically in the range of substantially 350 to 600

millimicrons, comprising; a sheet of material at least a portion of which have a reflectance of substantially 4% over the wavelength of substantially 325 millimicrons to substantially 525 millimicrons, and a reflectance which increases from substantially 4% at substantially 525 millimicrons to substantially 7% at 550 and which then increases to substantially 13% at substantially 575 millimicrons, whereby insufficient reflected



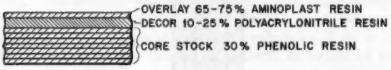
energy is available from said sheet of material and graphical information thereon to be distinguished by the detectors of typical copying machines at wavelengths to which they are most sensitive whereas sufficient reflected energy is available from said sheet of material and graphical information thereon to be distinguished by the retinas of human eyes at wavelengths to which they are most sensitive.

3,887,743

UNITARY PLASTIC LAMINATE

William C. Lane, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Nov. 9, 1972, Ser. No. 305,170
Int. Cl. B44f 1/00
U.S. Cl. 428—206 **5 Claims**



1. A unitary plastic laminate consisting essentially of a core impregnated with a phenolic resin, a decor sheet and an overlay impregnated with an aminoplast, said decor sheet having from 10 to 25% by weight of particulate polyacrylonitrile resin uniformly dispersed therein during manufacture thereof, said polyacrylonitrile resin being a copolymer of 85 to 98% by weight of acrylonitrile and 15 to 2% by weight of an ethylenically unsaturated monomer copolymerizable therewith, said polyacrylonitrile having a molecular weight ranging from 60,000 to 90,000.

3,887,744

COATED TRANSPARENT SHEETS

Nobuyuki Tomita, and Ken Yoshiki, both of Tokyo, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Oct. 13, 1969, Ser. No. 866,032
Claims priority, application Japan, Oct. 18, 1968, 43-76382
Int. Cl. B29d 11/00; B44d 5/06; C03c 17/00
U.S. Cl. 428—208 **10 Claims**

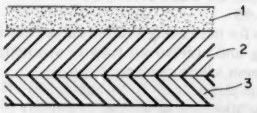
1. A transparent structure comprising a transparent sheet having a non-continuous coating of aluminum distributed over at least one surface of the sheet in a regular pattern, in the form of closely spaced parallel lines, there being from 10 to 50 lines of coating per inch, to provide a means of controlling the percentage transmission of visible light and infra-red radiation.

3,887,745

FINGER-TEARABLE ADHESIVE TAPE

Toshiya Yoshii, Kyoto, and Masaru Suzuki, Otsu, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Aug. 9, 1973, Ser. No. 387,023
Claims priority, application Japan, Sept. 8, 1972, 47-89511; Oct. 16, 1972, 47-118570
Int. Cl. B32b 7/00
U.S. Cl. 428—213 **8 Claims**



1. A finger-tearable adhesive tape having longitudinal and transverse dimensions and having an adhesive layer applied to a laminated film base, said base comprising a layer of propylene polymer film which is biaxially oriented and at least one other layer of a propylene polymer film which is uniaxially oriented in a transverse direction, the melting point of said uniaxially oriented film being 0.5° – 10° C higher than the melting point of said biaxially oriented film, and the total thickness of said uniaxially oriented film being 1.2 – 5.0 times greater than the total thickness of said biaxially oriented film.

3,887,746

LACQUERED ARTICLES OF COLD ROLLED ABS RESIN

Michael R. Grancio, Hampden, and George E. Walker, Longmeadow, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 26, 1972, Ser. No. 317,967
Int. Cl. B44d 1/14
U.S. Cl. 428—215 **7 Claims**

1. An article of manufacture comprising an impact resistant ductile composite of a cold rolled rubber reinforced resin specimen of 10–250 mil thickness having a normally embrittling coating of 0.1 to 10 mil thickness; wherein the minimum elongation beyond the yield point of the composite is at least 5 percent of the original length; wherein the rubber reinforced resin comprises a dispersion of a rubber graft copolymer in a matrix interpolymer; wherein the rubber graft copolymer comprises a superstrate of a graft copolymer of 5-95 parts by weight of a vinylidene aromatic hydrocarbon monomer and 95-5 parts by weight of a unsaturated nitrile monomer on a rubber substrate; wherein the weight ratio of superstrate to substrate is in the range of 10:100 to 250:100; wherein the matrix interpolymer is of about the same composition as the superstrate; wherein the rubber substrate comprises between 3 and 30 weight percent of the total resin; and wherein the average particle size of the rubber substrate is in the range of 0.01 to 1.5 micron.

3,887,747

NEW HOLLOW FILAMENTARY STRUCTURES

Yoshio Tamura, and Koichiro Ohtomo, both of Takatsuki, Japan, assignors to Kanebo Ltd., Tokyo and Nippon Kynol Inc., Osaka, both of, Japan

Filed Feb. 21, 1973, Ser. No. 334,203
Claims priority, application Japan, Feb. 24, 1972, 47-19458
Int. Cl. B28b 3/20; D02g 3/00
U.S. Cl. 428—229 **10 Claims**

1. A hollow ion-exchange novolak resin filament consisting essentially of from 50 to 100% by weight of a flame-resistant and anti-fusing cured novolak resin having an ion-exchange moiety and from 0 to 50% by weight of a fiber-forming thermoplastic synthetic resin selected from at least one of the group consisting of polyamide, polyester, polyolefin and polyurethane, with the provisos that the hollow structure continu-

ously extends in the axial direction of the filament, and the rate of hollowness is from 10 to 80%.

3,887,748
METHOD AND COMPOSITION FOR APPLYING A COVERING TO A WALL OR LIKE SUBSTRATE

Clyde J. Swedenberg, 3706 E. North St. Ext., Greenville, S.C. 29607; Charles C. Fain, Bayphone Estates, Clemson, S.C. 29631, and William W. Rutledge, 33 W. Tallulah Ave., Greenville, S.C. 29601

Filed Aug. 26, 1971, Ser. No. 175,388
Int. Cl. B32b *13/00*
U.S. Cl. 428—247 **11 Claims**

1. A decorative wall covering for installation upon a rigid wall for imparting a finished surface to the wall consisting essentially of:

a. a flexible lath of mesh material,

b. a substantially dry semi-hydrated flexible gypsum layer bonded on said material substantially covering one side of said lath,

c. a substantially uniform aqueous latex adhesive coating across an exposed side of said gypsum layer for securing said wall covering to said rigid wall and hydrating said gypsum,

d. said ratio of aqueous latex adhesive to gypsum is such that said aqueous latex adhesive supplies about three parts by weight of water for about ten parts of weight of gypsum, and

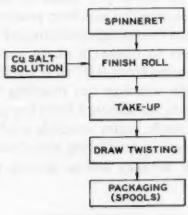
e. said semi-hydrated flexible gypsum being of sufficient thickness that said aqueous latex adhesive affords a sufficiently controlled amount of water to hydrate said gypsum and for inverting said latex adhesive,

whereby the wall covering may be shipped and stored in rolls preparatory to installation utilizing said application of aqueous latex adhesive.

3,887,749
STABILIZATION OF POLYESTER FILAMENTARY MATERIAL

Donald G. Pullum, Chesterfield; Eugene J. Corrigan, Village of Chester; Bernard H. Howard, Petersburg, and Bernard D. Stabley, Village of Chester, all of Va., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Aug. 21, 1972, Ser. No. 282,878
Int. Cl. C09k *3/28*
U.S. Cl. 428—284 **3 Claims**

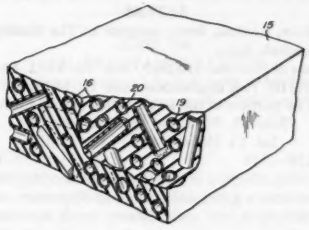


1. A rubber product containing filamentary material consisting essentially of polyester in contact with the rubber thereof, one million parts of the filamentary material containing a stabilizer consisting essentially of 20 to 1,000 parts of copper as a water solution or oil emulsion of a cupric salt of the class consisting of cupric citrate, sulfate, acetate, salicylate, formate, oleoate, linoleate, octoate, decanoate, and butyrate, which salt is surface applied, the concentration of the salt being greater adjacent the surface of the filaments in the material than farther from the surface.

3,887,750
COMPRESSIBLE PRINTING BLANKET

John C. Duckett, Clyde; Wayne W. Easley, and William T. Wickham, both of Waynesville, all of N.C., assignors to Dayco Corporation, Dayton, Ohio

Filed Jan. 8, 1973, Ser. No. 321,901
Int. Cl.² B41N *9/00*
U.S. Cl. 428—297 **7 Claims**



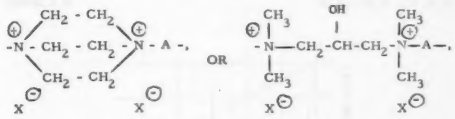
1. A laminated printing blanket comprising at least one fabric base ply, a surface layer, and a compressible intermediate layer, said intermediate layer comprising an elastomeric matrix having unconnected voids uniformly distributed therethrough, said voids defined by discrete hollow fibers having thin elastic walls made of vinylidene chloride-acrylonitrile copolymer which is compatible with said matrix material and capable of being bonded thereto upon curing.

3,887,751
ELECTROCONDUCTIVE SHEET MATERIAL AND PROCESS OF PREPARATION

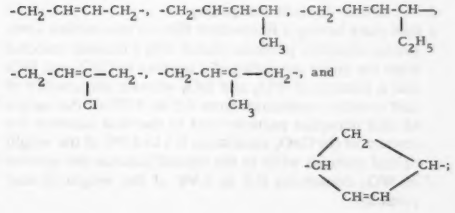
Albert H. Markhart, Wilbraham, and James O. Santer, East Longmeadow, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed May 12, 1972, Ser. No. 252,560
Int. Cl. D21h *1/38*
U.S. Cl. 428—342 **11 Claims**

1. An electroconductive sheet material comprising a base sheet and an electroconductive quaternary ammonium resin having recurring units of the general formula:



wherein X is bromine or chlorine,
wherein A is a divalent radical selected from the group consisting of



wherein the quaternary ammonium resin has an intrinsic viscosity of at least 0.05 in 2 percent aqueous sodium cloride at 25°C., wherein the weight ratio of base sheet to electroconductive resin is in the range of 1:1 and 500:1 and the electroconductive resin is present at a coating on at least one surface of the base sheet in an amount ranging from 0.5 to 15 pounds per 3000 sq. ft. of base sheet.

3,887,752

TEXTILE TREATMENT WITH AMPHOTERIC STARCH ESTERS

Lee H. Elizer, Keokuk, Iowa, assignor to The Hubinger Company, Keokuk, Iowa

Division of Ser. No. 308,963, Nov. 24, 1972, Pat. No. 3,793,310. This application June 21, 1973, Ser. No. 372,057The portion of the term of this patent subsequent to Feb. 19, 1991, has been disclaimed.

Int. Cl. D06m *11/00;* **C03c** *25/02*

U.S. Cl. 428—378 **14 Claims**

1. A process of sizing textile fibers which comprises coating such fibers with a gelatinized aqueous dispersion of an acylated amphoteric starch, said acylated amphoteric starch containing cationic, anionic and acyl groups connected to the starch molecules through carbon and oxygen, the cationic and anionic groups each constituting 0.5 to 6 groups per 100 anhydroglucose units, and the acyl groups constituting 2.5 to 7% by weight, calculated as acetyl groups, on a dry basis, said cationic groups being from the class consisting of tertiary amino, tertiary amine salt, quaternary amino, quaternary amine salt and cyanamide and said anionic groups being from the class consisting of sulfonic, sulfonate, carboxylic, carboxylate, phosphate and phosphonate, said cationic groups and said anionic groups being connected to oxygen of the starch molecule.

3,887,753

FLUORESCENT FILM FOR COLOR PICTURE TUBE AND PROCESS OF PREPARING SAME

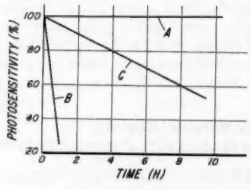
Chikayoshi Ninagawa, Takatsuki; Osamu Yoshida, Kyoto, and Shigeya Ashizaki, Hirakata, all of Japan, assignors to Matsushita Electronics Corporation, Kadoma-shi, Osaka, Japan

Continuation-in-part of Ser. No. 62,150, Aug. 7, 1970, abandoned, which is a continuation of Ser. No. 650,827, July 3, 1967, abandoned. This application June 27, 1973, Ser. No. 374,099

Claims priority, application Japan, July 22, 1966, 41-48443

Int. Cl. B44d *5/00;* **G03c** *5/02*

U.S. Cl. 428—328 **6 Claims**



1. A cathode ray tube comprising

a face plate having a fluorescent film on one surface comprising phosphor particles coated with a member selected from the group consisting of a mixture of GeO_2 and SiO_2 and a mixture of WO_3 and SiO_2 wherein the amount of said member constitutes from 0.5 to 5.0% of the weight of said phosphor particles and in the first instance the amount of the GeO_2 constitutes 0.3 to 4.9% of the weight of said particles while in the second instance the amount of WO_3 constitutes 0.3 to 4.9% of the weight of said particles.

3,887,754

PARTICULATE EXPANDABLE STYRENE POLYMERS HAVING DESIRABLE PROCESSING PROPERTIES

Manfred Walter, Speyer, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany and Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

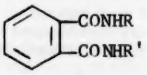
Filed May 30, 1973, Ser. No. 365,217

Int. Cl. C09k *3/00*

Claims priority, application Germany, May 30, 1972, 22 26168

U.S. Cl. 428—407 **4 Claims**

1. Particulate expandable styrene polymers having short minimum residence times in the mold and having a coating of from 0.05 to 2% by weight of a carboxamide melting between 50° and 110°C and having the formula



wherein the acid component is selected from the group consisting of dihydrophthalic acid, tetrahydrophthalic acid and phthalic acid and wherein R and R' are alkyl groups of from eight to 22 carbon atoms.

3,887,755

LAMINATING ADHESIVES

Joseph Zamer, Paramus, N.J., assignor to Inmont Corporation, New York, N.Y.

Filed Sept. 11, 1973, Ser. No. 396,237

Int. Cl. B32b *27/40*

U.S. Cl. 428—424 **6 Claims**

1. A laminate of the group consisting of saran adhesively bonded to saran, saran adhered to treated polyethylene or treated polypropylene, and treated polyethylene adhered to treated polyethylene wherein the adhesive is a mixture of a minor amount of a terpene urethane resin which is the reaction product of a terpene alcohol with a polyisocyanate, and a major amount of a water soluble salt of a substantially linear thermoplastic polyurethane containing 0.5 to 2.5% by weight of nitrogen derived from tertiary amine groups and from 2 to 8% of nitrogen derived from isocyanate groups, said polyurethane being prepared by (a) reacting an excess of an isocyanate with a mixture of diols consisting of polyether diols having a molecular weight of from 425 to 4,000 and tertiary amine diols selected from the group consisting of N-phenyl dialkanol amine and N-lower alkyl dialkanol amines to obtain a reaction product having free isocyanate groups greater than 0.1 milliequivalents of NCO per gram of solution at 50% solids, (b) chain extending the reaction product with a chain extender selected from the group consisting of alkanol amines and alkylene diamines to obtain a chain extended polyurethane polymer containing from 0.07 to 0.1 milliequivalents of NCO per gram of 50% solution, (c) reacting the free isocyanate groups with a material selected from the group consisting of water miscible alcohols, water miscible acids and water, an amount of a water miscible acid being added sufficient to form the acid salts of the tertiary amine groups present on the polyurethane.

3,887,756

POLYMER-BASE PAINTED RESIN CURED UNSATURATED ELASTOMERIC SUBSTRATES

Jeffrey M. Gerstin, East Brunswick, and Lawrence Spenadel, Westfield, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Dec. 26, 1972, Ser. No. 318,020

Int. Cl. B32b *25/08;* **B44d** *1/22*

U.S. Cl. 428—425 **14 Claims**

1. A polymer base painted resin cured elastomer composition comprising:

A. at least one elastomer selected from the group consisting of butyl rubber and an EPDM rubber wherein the diene termonomer component is an alkylidene norbornene, and the chloro and bromo-derivatives thereof;
B. a heat reactive phenol-aldehyde resin;
C. a metal oxide or halide wherein the metal is selected from the group consisting of metals of Groups IIB, IIIB, IVB and VIII;
wherein the composition contains at least one of the foregoing components selected from the group consisting of (A) and (C) which serves as a halogen donor, by containing chemically combined halogen selected from the group consisting of chlorine and bromine; and
D. a polyurethane base paint coated on said cured elastomer.

3,887,757
LAMINATES HAVING A POLYURETHANE ADHESIVE

Edward Stone, Morris Plains; Joseph Zamer, Paramus; Matthew Guagliardo, Bloomfield, and Kenneth F. Wieland, Pompton Plains, all of N.J., assignors to Inmont Corporation, New York, N.Y.

Filed May 29, 1973, Ser. No. 364,817
Int. Cl. B32b *27/40*
U.S. Cl. 428—425 **6 Claims**

1. A laminate of the group consisting of saran adhesively bonded to saran, saran adhered to treated polyethylene and treated polyethylene adhered to treated polyethylene wherein the adhesive is a water soluble salt of a substantially linear thermoplastic polyurethane containing 0.5 to 2.5% by weight of nitrogen derived from tertiary amine groups and from 2 to 8% of nitrogen derived from isocyanate groups, said polyurethane being prepared by (a) reacting an excess of an isocyanate with a mixture of diols consisting of polyether diols having a molecular weight of from 425 to 4,000 and tertiary amine diols selected from the group consisting of N-phenyl dialkanol amine and N-lower alkyl dialkanol amines to obtain a reaction product having free isocyanate groups greater than 0.1 milliequivalents of NCO per gram of solution at 50% solids, (b) chain extending the reaction product with a chain extender selected from the group consisting of alkanol amines and alkylene diamines to obtain a chain extended polyurethane polymer containing from 0.07 to 0.1 milliequivalents of NCO per gram of solution at 50% solids, (c) reacting the free isocyanate groups with a material selected from the group consisting of water miscible alcohols, acids and water, and adding an amount of a water miscible acid being added sufficient to form the acid salts with the tertiary amine groups present on the polyurethane.

3,887,758
OIL RESISTANT LEATHER

Anthony J. Butler, and Daniel R. Pail, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Apr. 19, 1974, Ser. No. 462,274
Int. Cl. B44d *1/32*
U.S. Cl. 428—540 **5 Claims**

1. A method of preparing an oil resistant leather which comprises impregnating the leather with an organosilicon resin curable at room temperature, said resin having been prepared by mixing
1. from 1 to 65 percent by weight of a dimethylpolysiloxane containing silicon-bonded hydroxyl groups having on the average from 5 to 50 siloxane units per molecule which can contain up to 10 mol percent monomethylsiloxane units,
2. from 15 to 70 percent by weight of a siloxane resin containing silicon-bonded hydroxyl groups having a phenyl-to-silicon ratio of at least 0.3, a hydrocarbon radical to silicon ratio of 1 to 1.5 in which the hydrocarbon radicals are of the group consisting of phenyl and methyl, and
3. from 5 to 65 percent by weight of a silane of the formula $RSiX_3$ in which X is acetoxy, lower alkoxy, —ON=CR′$_2$, —NR′$_2$, —ONR′$_2$ or —NR′(O=CR′) in which R is an aliphatic hydrocarbon radical of 1 to 2 carbon atoms and R′ is a lower alkyl radical and thereafter allowing the resin to cure.

ELECTRICAL

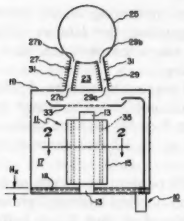
3,887,759
EVAPORATIVE COOLING SYSTEM EMPLOYING LIQUID FILM EVAPORATION FROM GROOVED EVAPORATOR SURFACE AND VAPOR PUSH PUMP FOR CIRCULATING LIQUID

Fred W. Staub, and Philip G. Kosky, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 310,323, Nov. 29, 1972, abandoned. This application Mar. 20, 1974, Ser. No. 452,945

Int. Cl. H01f *27/18*

U.S. Cl. 174—15 R 3 Claims



1. In combination: a vaporization chamber containing heat producing electrical apparatus to be cooled while dielectrically protected and a two phase dielectric fluid comprising a liquid and a vapor, said apparatus including at least one cooling duct extending vertically therethrough, said duct having a plurality of longitudinal extending vertical grooves in its side wall, said liquid residing at a bottom portion of the chamber and having a liquid level above the bottom of the chamber, said liquid also being distributed as a film which coats said apparatus and coats the vertical grooves of said duct, said vapor being produced by vaporization of said liquid by said heat produced by said apparatus, said vapor occupying space in said chamber above said liquid level, a condenser having one end thereof connected to and communicating with an upper portion of said vaporization chamber occupied by said vapor, a reservoir containing a predetermined mass of non-condensable dielectric gas positioned above said condenser, said condenser having another end connected to and communicating with said reservoir and said gas therein, said gas forming an interfacial contact with said vapor in said condenser at a region therein between said ends of said condenser, said vapor condensing to form liquid condensate in the condenser on one side of said interfacial contact so that the effective condensation area of said condenser lies between said one end of said condenser and said interfacial contact; distribution means in said chamber positioned above said electrical apparatus for receiving liquid condensate from said condenser and distributing the liquid condensate as a film coating said apparatus and coating the vertical grooves of said duct, and a condensate make-up pump for pumping liquid from the bottom portion of the chamber to said distribution means.

3,887,760
LAYER CIRCUIT WITH AT LEAST ONE SOLDER PLATFORM FOR THE SOLDERING ON OF SEMICONDUCTOR MODULES

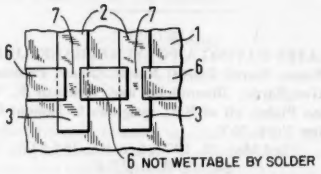
Friedrich Krieger, Gilching, and Christian Stein, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 4, 1974, Ser. No. 439,116

Claims priority, application Germany, Feb. 14, 1973, 2307325

Int. Cl. H05k *1/18*

U.S. Cl. 174—68.5 3 Claims



1. A layer circuit having at least one conductor path extending therealong, a platform of solder on one end of said conductor path, and a layer extending across part of said conductor path beyond said solder platform, said layer being not wettable by solder, thereby separating said solder platform from the remainder of said conductor path by a narrow constriction.

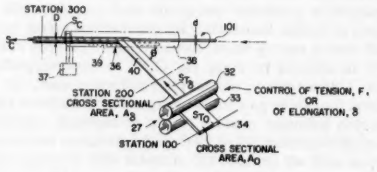
3,887,761
TAPE WRAPPED CONDUCTOR

Wilbert L. Gore, Newark, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Division of Ser. No. 666,007, Sept. 7, 1967, abandoned. This application Feb. 20, 1973, Ser. No. 333,470

Int. Cl. H01b *7/02*

U.S. Cl. 174—110 R 10 Claims



1. An insulated electrical conductor of continuous length having exceptionally uniform outside diameter, said insulated conductor comprising:

a. a conductor of continuous length;

b. a synthetic polymeric tape spirally wrapped about said conductor;

c. said tape having the physical property that at strains above about 5% the tape exhibits a small slope in its characteristic stress-strain curve;

d. said tape having been constantly elongated during the wrapping process; and

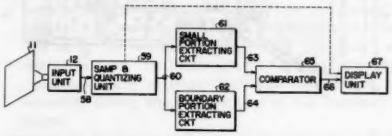
e. said tape having a substantially constant width along the length of said conductor

f. said insulated conductor having a uniform outside diameter.

3,887,762
INSPECTION EQUIPMENT FOR DETECTING AND EXTRACTING SMALL PORTION INCLUDED IN PATTERN

Takeshi Uno, Sayama; Haruo Yoda, Hachioji; Masakazu Ejiri, Tokorosawa; Michihiro Mese, Kokubunji, and Sadahiro Ikeda, Tachikawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 20, 1972, Ser. No. 307,870
Claims priority, application Japan, July 8, 1972, 47-75069
Int. Cl. H04n *1/38*
U.S. Cl. 178—6 **18 Claims**

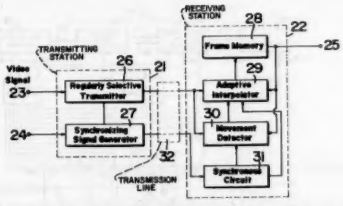


1. Inspection equipment for detecting and extracting small portions in a pattern comprising:
   a. input means for sequentially scanning a pattern to be inspected and converting said pattern into an electrical video signal;
   b. means for sampling said video signal at a predetermined sampling time interval corresponding to one picture element of said pattern to be inspected and converting said video signal into a binary coded video signal;
   c. a two-dimension image extracting means for rearranging the one-dimensionally arranged output from said sampling and binary coding means into a two-dimensionally arranged signal; and
   d. small portion processing means for extracting a desired video signal from said video signal stored in said two-dimensional image extracting means, thereby extracting a small portion from said pattern.

3,887,763
VIDEO SIGNAL TRANSMISSION SYSTEM

Shigehiko Hinoshita, Yokohama; Yukihiko Minejima, Kawasaki, and Takao Moriya, Yamato, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed July 17, 1973, Ser. No. 380,117
Claims priority, application Japan, July 19, 1972, 47-71596
Int. Cl. H04n *1/00*
U.S. Cl. 178—6 **6 Claims**



1. A video signal transmission system for transmitting a video signal of compressed bandwidth over a transmission medium, wherein the video signal to be transmitted defines successive picture frames, each of plural picture elements, said system comprising:
   A. a transmission station including:
      1. a synchronizing signal generator for producing a first clock signal synchronized with the video signal; and
      2. a regularly selective transmitter responsive to the first clock signal for removing from the video signal to be transmitted, selected ones of the picture elements of each picture frame, thereby forming and transmitting a video signal sequence corresponding to said selected picture elements, in succession, and
   B. a receiving station including:
      1. a synchronizing signal generator for producing a second clock signal synchronized with the first clock signal of said transmission station;
      2. a frame memory for storing the transmitted video signal sequence corresponding to the selected picture elements of one frame;
      3. a movement detector for comparing the video signal sequence transmitted from said transmission station for a given frame, as received, with the video signal sequence of a previous picture frame, as previously received and stored in said frame memory, for judging whether the video signal sequence of the said given frame belongs to a moving picture or to a stationary picture and for producing a movement detecting signal in accordance therewith; and
      4. an adaptive interpolator responsive to successive, received video signal sequences, for replacing the video signal sequence of a given frame stored in same frame memory with the next successive, received video signal sequence for the successive frame, and selectively operable in response to the movement detecting signal for a stationary picture, to interpolate and produce from the said stored, second video signal sequence a corresponding, successive second video signal sequence and replace the said stored second sequence of said frame memory with the said successive video sequence interpolated therefrom, and, for a moving picture, to interpolate and produce from the said next successive received video sequence a corresponding, succesive second video signal sequence and replace the said stored second sequence with said second video signal sequence interpolated from the said received, next successive video signal sequence, thereby to store in said memory a video signal sequence for the plural picture elements of one frame.

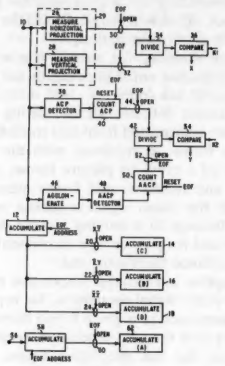
3,887,764
FEATURE CLASSIFICATION IN IMAGE ANALYSIS

John Michael Gibbons, and William Ralph Knowles, both of Royston, England, assignors to Image Analysing Computers Limited, Melbourn, Royston, Hertfordshire, England

Filed May 5, 1972, Ser. No. 250,501
Claims priority, application United Kingdom, May 6, 1971, 13591/71
Int. Cl. H04n *7/00*
U.S. Cl. 178—6.8 **17 Claims**

1. A method of classifying a region of a polished steel surface containing non-metallic inclusions which appear darker than the remainder of the steel surface, comprising the steps of scanning an image of the region in a series of parallel lines forming a raster, generating an amplitude varying video signal from the scanning, in which the amplitude has a first value corresponding to the steel, a second value corresponding to sulphide inclusions and a third value corresponding to oxide inclusions, comparing the video signal with a first reference voltage between the said first and second values and with a second reference voltage between the said second and third values, generating a first detected signal of pulses generated whenever the video signal amplitude has a value between the first and second reference voltages and a second detected signal of pulses generated whenever the video signal amplitude has a value below the second reference voltage, performing measurements on the pulses forming the second detected signal arising from scanning the whole region to produce at

least first and second output signals, comparing the relative magnitudes of said output signals and generating a classifying



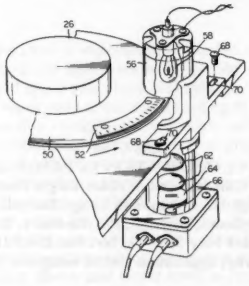
signal for the region in response to the comparison of the output signals.

3,887,765

OPTICAL LINE SCANNING SYSTEM

Katsuo Murahse, and Kazuyuki Hara, both of Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Mar. 21, 1974, Ser. No. 453,382
Claims priority, application Japan, Apr. 22, 1973, 48-45467
Int. Cl. H04n *1/10*
U.S. Cl. 178—7.6 **19 Claims**



1. In an optical line scanning system having a rotary scanner body carrying a plurality of scanning elements thereon which are equiangularly spaced about the axis of the scanner body, and an optical system to focus an image of the line on the rotary scanner body so that the image of the line will be swept by the scanning elements upon rotation of the scanner body, the improvement comprising:

a timing member rotatable with the scanner body and having one set of timing marks thereon indicating the angular position of the scanner body relative to the position of the line being scanned by the scanning elements; and

a plurality of sensing heads arranged adjacent to said timing member to sense said timing marks and produce electrical signals in response thereto;

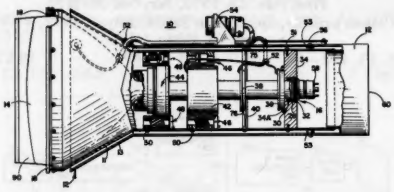
the sensing heads being substantially equiangularly spaced about the circumference of the timing member and the number of said sensing heads being equal to the number of said scanning elements, each of said sensing heads being associated with a respective scanning element.

3,887,766

CRT ASSEMBLY

Robert L. Caswell, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 6, 1973, Ser. No. 422,444
Int. Cl. H01j *29/06;* **H04n** *5/645*
U.S. Cl. 178—7.82 **8 Claims**



1. A cathode ray tube assembly for housing a CRT comprising:

at least one precision positioner means having an aperture to accommodate said CRT;

front plate means for securing the face end portion of said CRT;

at least one coil holder means having an aperture to accommodate another portion of said CRT;

clamp means for securing still another portion of said CRT; said clamp means comprising a housing having a threaded aperture therein through which said CRT extends, a retainer ring having a threaded outer surface, and a pliable spacer, which expands into said aperture when said retainer ring is threaded into said threaded aperture of the clamp housing and compresses said spacer thereby forcing said pliable spacer to grip said CRT; and

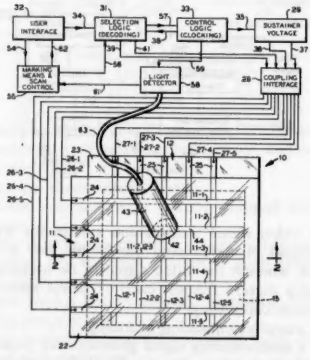
magnetic shield means connected to said front plate means, said precision positioner, said coil holder and said clamp housing to provide a support structure therefor.

3,887,767

METHOD OF AND SYSTEM FOR LIGHT PEN READ-OUT MULTICELLED GASEOUS DISCHARGE DISPLAY/MEMORY DEVICE

John W. V. Miller, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 1, 1973, Ser. No. 401,971
Int. Cl. G08b *5/22;* **G11c** *7/00;* **H05b** *41/00*
U.S. Cl. 178—18 **33 Claims**



1. The method of ascertaining the location of one or more selected cells in a multicelled gas discharge display/memory device, each said cells comprising an electrode in a first array

common to a plurality of cells, an electrode in a second array spaced from the electrode of the first array, a volume of ionizable gas in the vicinity of the electrodes of the first and second arrays, and at least one dielectric layer separating one of the electrodes from the gas volume, the cells having the characteristics that individual cells are sustained in their "on state" or "off state" of discharge when subjected to a sustainer voltage between respective electrodes of the first and second array which is periodically alternating between sustainer voltage magnitudes on opposite sides of a neutral voltage including:

positioning a pickup for discharge radiation in registry with the selected cells;

interrupting the application of the sustainer voltage alternations between the electrodes of the first and second array; transferring in succession each of a plurality of cells in an "off state" of discharge between an "off state" of discharge and an "on interrogation state" of discharge to cause said cells to issue discharge radiation at unique moments during the interruption of the sustainer alterations;

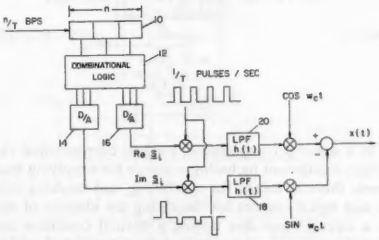
sensing the discharge radiation of the selected cell by said pickup means when that cell is transferred between the "off state" and an "on interrogation state;" and

correlating the sensing of the discharge with the transfer of the selected cells discharge state.

3,887,768
SIGNAL STRUCTURES FOR DOUBLE SIDE BAND-QUADRATURE CARRIER MODULATION

George David Forney, Jr., and Robert G. Gallager, both of Lexington, Mass., assignors to Codex Corporation, Newton, Mass.

Filed Sept. 14, 1971, Ser. No. 180,289
Int. Cl. H04l *27/18*
U.S. Cl. 178—67 **8 Claims**



1. A double side band-quadrature carrier modulation system comprising

input means for receiving a sequence of symbols a_k at a rate $1/T$ per second.

coding means connected to said input means for providing from said symbbols a sequence of complex valued signal points d_k drawn from an alphabet comprising M points arranged in a multiplicity of concentric rings in the complex plane including an innermost ring having four equally spaced points and a plurality of additional rings each having four equally spaced points, each said ring being rotated by 45° with respect to adjacent said rings, and

modulating means connected to said coding means for providing from said signal points a signal in the form

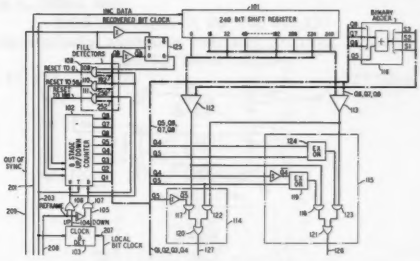
$$x(t) = \mathrm{Re}\left[\sum_k d_k \; h(t-kT)\; e^{jw_c t}\right],$$

where $h(t-kT)$ represents an impulse response, w represents a carrier frequency, t represents time, j equals -1, and k is the index of d_k and a_k.

3,887,769
FRAME SYNCRHONIZATION OF ELASTIC DATA BIT STORES

Michael Peter Cichetti, Jr., Staten Island, N.Y., and Robert Jeffrey Fretz, Red Bank, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 4, 1973, Ser. No. 347,851
Int. Cl. H04l *7/00*
U.S. Cl. 178—69.5 R **8 Claims**



1. An elastic store for receiving incoming frames of serial data, each frame having a fixed number of bits and including at least one framing bit for defining the demarcation between successive incoming frames, comprising,

variable delay means for delaying the bits and thereby producing bits delayed a predetermined interval of time;

a local clock for generating framing pulses;

means for detecting the misalignment in time of the delayed framing bit and the generated framing pulse; and

means operated in response to the detecting means for cumulatively increasing the delay of the delay means by an interval of time equal to the interval that the increasing means is operating, said increasing means commencing operation at the time that the delayed framing bit is produced and concluding operation at the time that the framing pulse is generated.

3,887,770
DECODER APPARATUS ADAPTED FOR DIFFERENT 4-HANNEL MATRIX SYSTEMS

Susumu Takahashi, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Nov. 28, 1973, Ser. No. 419,527
Claims priority, application Japan, Nov. 30, 1972, 47-120032
Int. Cl. H04r *5/00*
U.S. Cl. 179—1 GQ **8 Claims**

1. A decoder apparatus for decoding two-channel composite signals obtained by different four-channel matrix systems into four-channel signals in the form well matching any of said matrix systems comprising:

first means connected to receive the two-channel composite signals for producing a sum signal;

second means connected to receive the two-channel composite signals for producing a difference signal;

third means connected to receive the sum and difference signals for additively combining the sum and difference signals to produce a first reproduced signal associated with one of front channels;

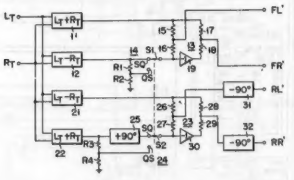
fourth means connected to receive the sum and difference signals for subtractively combining the sum and difference signals to produce a second reproduced signal associated with the other of the front channels;

fifth means for selectively varying an amplitude level ratio between the sum and difference signals supplied to said third and fourth means in accordance with the type of the two-channel composite signals being decoded;

sixth means connected to receive the two-channel composite signals for generating a difference signal;

seventh means connected to receive the two-channel composite signals for generating a sum signal;

eighth means connected to receive the difference signal from said sixth means and the sum signal from said seventh means for additively combining the sum and difference signals to obtain a third reproduced signal associated with one of rear channels;



ninth means connected to receive the difference signal from said sixth means and the sum signal from said seventh means for subtractively combining the sum and difference signals to obtain a fourth reproduced signal associated with the other of the rear channels;

tenth means for varying an amplitude level ratio between the sum and difference signals supplied to said eighth and ninth means simultaneously with the ratio varying operation of said fifth means; and

at least one first phase shifting means selectively connected in circuit or out of circuit with respect to the inputs to said eighth and ninth means simultaneously with the ratio varying operation of said fifth and tenth means such that when said first phase shifting means is in circuit one input to said eighth and ninth means is phase shifted with respect to the other input thereto and when said first phase shifting means is out of circuit it produces no relative phase shift of the input signals to said eighth and ninth means.

3,887,771

TELEPHONE ADAPTER

Abram N. Spanel, 344 Stockton St., Princeton, N.J. 08540

Filed Mar. 4, 1974, Ser. No. 447,690

Int. Cl. H04m *1/21*

U.S. Cl. 179—1 C **15 Claims**

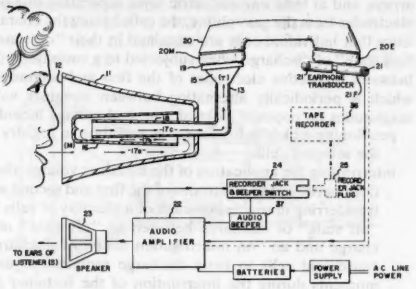
1. An adapter for a telephone permitting its hands-free use, comprising:

an exponential re-entrant horn having walls forming sound passages, said horn decreasing in acoustical cross-section from its mouth towards its tail portion;

a coupling end connecting with said tail portion to provide acoustic coupling with the telephone microphone;

a housing within which said horn is mounted, said mouth of said horn opening through a first part of said housing, and said coupling end opening through a second part of said housing substantially removed from said first part and outside the perimeter of said horn mouth, the area of said mouth being larger than the area of said coupling end, producing acoustic amplification between said mouth and said coupling end; and

means for making audible communications received by the



telephone earphone including speaker means external of said housing.

3,887,772

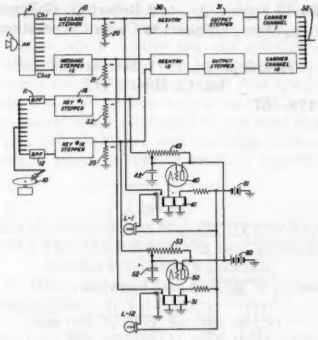
SIGNAL PRIVACY WITH SAFETY FEATURE

Ralph L. Miller, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 30, 1944, Ser. No. 542,976

Int. Cl. H04m *1/68;* **H04k** *1/02*

U.S. Cl. 179—1.5 M **2 Claims**



1. In a signal privacy system, a signal current input circuit, a privacy equipment including a source for supplying masking currents thereto, means for combining said masking currents with said signal current for disguising the identity of the signals, a circuit controller having a normal condition and an operated condition, means to impress a portion of said masking currents from said source on said circuit controller, said portion normally having a critical value such as to hold said controller in its normal condition, said circuit controller in its operated condition disabling said signal current input circuit for supplying signal current to said combining means.

3,887,773

AUTOMATIC TELEPHONE ANSWERING APPARATUS

Yuji Urayama, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed May 14, 1974, Ser. No. 469,872

Claims priority, application Japan, May 17, 1973, 48-57221

Int. Cl. H04m *1/64*

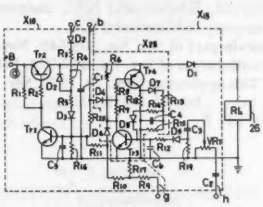
U.S. Cl. 179—6 R **8 Claims**

1. In an automatic telephone answering apparatus of the type operating in response to an incoming call arriving through a telephone line from a caller to reproduce an answering message previously recorded on a recording medium and

to send out the reproduced signal to a telephone line, the combination of:

telephone line connecting means operating in response to the incoming call to connect the apparatus to the telephone line;

detection and storing means for detecting and storing an indication that the caller has replaced his telephone receiver on its cradle to cut off the telephone line connection of the caller side; and

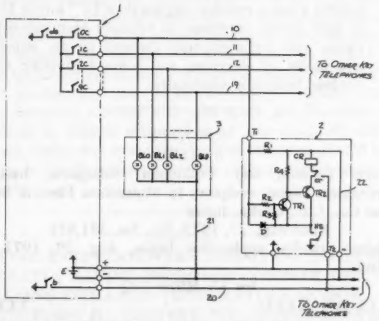


control means for holding the telephone line connecting means in its operative state of connecting the apparatus to the telephone line until the apparatus places the recording medium in a state wherein the answering message can be reproduced from the starting point thereof even when the detection and storing means operates when the apparatus is in an intermediate point in its answering operation and for releasing thereafter the telephone line connecting means from its operative state.

3,887,774
TRANSISTOR SWITCHING CIRCUIT FOR USE IN A TELEPHONE SYSTEM

Hachiroh Takubo; Kengo Sudoh, both of Kawasaki, Japan, and Stephen Kerman, Merrick, N.Y., assignors to Nippon Tsu Shin Kogyo K.K., Kanagawa, Japan and TIE/Communications, Inc., Stamford, Conn.

Filed Mar. 14, 1973, Ser. No. 341,201
Int. Cl. H04m *3/22*
U.S. Cl. 179—99 **5 Claims**



1. A switching circuit comprising

a semiconductor switching circuit means having a first input terminal, a second input terminal and an output terminal, a first signalling means for producing a first signal output, said output connected by a single conductor to the first input terminal of the semiconductor switching means,

a second signalling means for producing a second signal output, said output connected to the second input of the semiconductor switching means, and

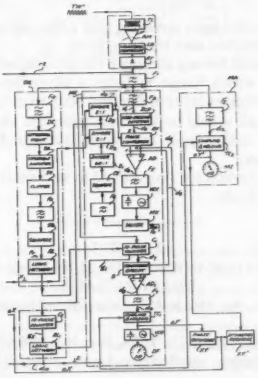
a first responsive means connected to the output terminal of the switching means and a second responsive means connected to the single conductor of said first signalling means,

the semiconductor switching circuit means producing a first output signal at its output terminal for operating the first responsive means, said first switching output signal being produced in response to the first output signal from the first signalling means, independent of the signal from said second signalling means, and the switching means also producing a second output signal at its first input terminal in response to the second output signal from the second signalling means, for operating the second responsive means.

3,887,775
SYSTEM FOR MEASURING GROUP DELAY IN SIGNAL TRANSMISSION

Nicola Montefusco, and Alfredo Barlucchi, both of Milan, Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Oct. 31, 1973, Ser. No. 411,237
Claims priority, application Italy, Oct. 31, 1972, 31144/72
Int. Cl. H04b *3/46*
U.S. Cl. 179—175.3 R **22 Claims**



1. A system for measuring the relative phase shift between a selected carrier frequency f_M and a standard carrier frequency f_R on passing through a test object, said carrier frequencies being amplitude-modulated by a common modulating frequency f_m and being alternately transmitted through said test object under the control of a switching signal with a commutation frequency f_c, comprising:

a receiver for said carrier frequencies provided with an amplitude demodulator for detecting a carrier envelope with a frequency component of said modulating frequency f_m undergoing two opposite phase shifts during a switching cycle $1/f_c$;

a phase discriminator connected to the output of said amplitude demodulator and including zero-crossing detector for deriving from said envelope a measuring square wave in phase with said frequency component thereof;

a phase-locking loop in said phase discriminator including a tunable oscillation generator, wave-shaping means for deriving a reference square wave of frequency f_m from the output of said oscillation generator, and a phase comparator receiving said measuring and reference square waves for producing a control signal proportional to the mean phase difference between said square waves to tune said oscillation generator with stabilization of the phase of said reference square wave at the mean phase of said measuring square wave; and

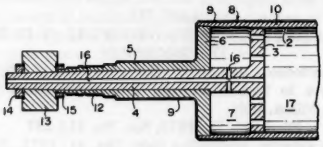
output means in said phase discriminator for deriving from said phase comparator a voltage proportional to the abso-

lute phase difference between said square waves as a measure of said relative phase shift.

3,887,776
CONDUCTOR ROLL

Masahiko Kanbayashi, Tokyo, Japan, assignor to Yamato Kogyo Kabushiki Kaisha, Japan

Filed Jan. 3, 1974, Ser. No. 430,522
Claims priority, application Japan, July 27, 1973, 48-84669
Int. Cl. B01k *3/00*
U.S. Cl. 191—1 A **5 Claims**

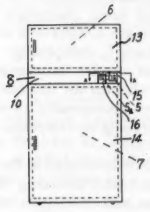


1. A conductor roll for conducting electrical plating current, comprising:
a hollow steel roll body having an inner surface and an outer surface;
a hard metallic layer covering said outer surface; a copper layer plated on said inner surface;
a copper shaft having a copper flange integrally connected thereto, which flange includes a silver layer in contact with the copper layer of said roll body to mount the flange of the shaft in said hollow body with firm electric contact between said copper and silver layers and said copper flange; and
an electric conductor ring affixed to said shaft externally of said roll body.

3,887,777
REFRIGERATOR DOOR SWITCH HAVING VERTICAL DRAIN PASSAGE

Shiro Nishino, No. 462 Nakakosaka, Higashiosaka-shi, Osaka, Japan

Filed Aug. 22, 1973, Ser. No. 390,612
Claims priority, application Japan, Aug. 31, 1972, 47-102315
Int. Cl. H01h *3/16*
U.S. Cl. 200—61.69 **1 Claim**

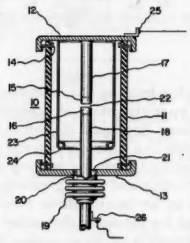


1. In combination with a refrigerator having a refrigerator door and a freezing chamber door, a door switch comprising the combination of:
a. a casing having a main body portion, a flange portion and at least two laterally spaced members interconnecting said main body portion and said flange portion, said laterally spaced members forming at least one vertical water-draining passage between said flange portion and said main body portion of said casing for draining water running out of said freezing chamber downwardly through said casing, and
b. at least two push buttons mounted on the opposite side of said flange portion from said main body portion and extending into said laterally spaced members for operating switches within said casing, one of said push buttons engaging the refrigerator door and the another of said push buttons engaging the freezing chamber door.

3,887,778
VACUUM ARC DEVICE WITH IMPROVED ARC-RESISTANT ELECTRODES

George A. Farrall, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 305,649, Nov. 10, 1972, which is a continuation of Ser. No. 117,924, Feb. 24, 1971, abandoned. This application Sept. 13, 1973, Ser. No. 396,817
Int. Cl. H01h *33/66*
U.S. Cl. 200—144 B **3 Claims**



1. A vacuum arc device comprising:
a. an hermetically sealed envelope evacuated to a pressure of 10^{-5} torr or less;
b. at least a pair of arc-electrodes within said envelope adapted to form an inter-electrode gap;
c. at least a surface portion of each of said arc-electrodes being capable of sustaining a high current vacuum arc,
c_1. at least one of said surface portions comprising an alloy of titanium and approximately 1–5 weight percent of beryllium,
c_2. said alloy having less than 10^{-6} atomic parts of sorbed gases and containing no constituents thereof which exhibit a vapor pressure higher than 10^{-3} torr at 500°C.
d. said device operating to conduct high current between said arc electrodes through an arc consisting essentially of electrons and ionized metallic specie evolved from said electrodes.

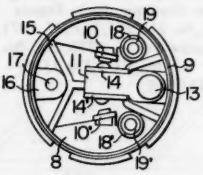
3,887,779
SWITCH

Heiroku Tanaka, and Yoshinobu Nakagawa, both of Neyagawa, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 27, 1973, Ser. No. 391,871
Claims priority, application Japan, Aug. 29, 1972, 47-101102
Int. Cl. H01h *3/42*
U.S. Cl. 200—153 L **3 Claims**

1. A switch comprising a switch casing made of an insulating material, at least two fixed contacts arranged on said switch casing, a movable contact piece pivotably mounted on a supporting post on said switch casing to engage and disengage with said fixed contacts, at least two mounting projections disposed on said switch casing in the vicinity of said fixed contacts, each of said mounting projections being formed with a first groove for preventing the deterioration of voltage proof, a driving plate mounted on a step projection formed on said switch casing and an engaging projection formed on the lower surface of said driving plate, said engaging projection being connected to change the position of said movable contact

piece, and a spring provided between a cam member for effecting a switching operation of said driving plate and said



driving plate to separate said cam member and said driving plate from each other.

3,887,780

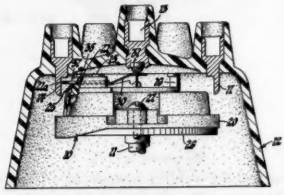
IGNITION DISTRIBUTOR ROTOR

Dwight O. Crim, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 377,646, July 9, 1973. This application Sept. 18, 1973, Ser. No. 398,564

Int. Cl. H01h *3/00*

U.S. Cl. 200—19 DR **5 Claims**



1. An ignition distributor rotor of the type which is rotated by a driving shaft within a distributor cap having a center input terminal and a plurality of output terminals circumferentially arranged about the input terminal comprising: a body member of an electrically nonconductive material adapted to be rotated by said driving shaft, a spark gap electrode of an electrically conductive material supported by and having a tip portion extending beyond an edge of said body member which is passed in spark gap relationship with successive ones of said output terminals as said body member is rotated by said shaft, and an auxiliary electrode of an electrically conductive material in electrical contact with said spark gap electrode and positioned in register with said spark gap electrode along a common radius and extending beyond the edge of said body member in the direction of said tip portion of said spark gap electrode.

3,887,781

METAL BASE COOKWARE INDUCTION HEATING APPARATUS HAVING IMPROVED CONTROL CIRCUIT USING INFRA-RED TEMPERATURE SENSOR

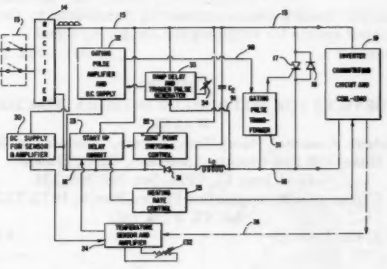
Philip H. Peters, Jr., Greenwich, N.Y., assignor to Environment/One Corp., Schenectady, N.Y.

Division of Ser. No. 131,648, April 6, 1971, Pat. No. 3,710,062. This application June 9, 1972, Ser. No. 261,227

Int. Cl. H05b *5/04*

U.S. Cl. 219—10.49 **13 Claims**

1. A temperature set and control circuit including an infra-red heat sensor device arranged to view an object whose temperature is to be controlled, a constant current amplifier connected in series circuit relationship with the infra-red heat sensor device across a source of low voltage direct current excitation potential, means for periodically interrupting the view of the infra-red heat sensor device to produce an output alternating current signal component whose amplitude is indicative of the temperature of the object, an alternating current amplifier, an adjustable temperature set impedance coupled to and controlling the gain of said alternating current amplifier, the setting of said adjustable temperature set impedance serving to establish the temperature level at which the output from the alternating current amplifier attains an operative level of magnitude, output on-off control amplifier means coupled to and controlled by the output from said alternating current amplifier for producing an amplified output on-off control signal representative of the temperature of the object whose temperature is being controlled in accordance with the temperature setting of the adjustable temperature set impedance, and means for supplying operating bias potentials from a common reference point on the source of low voltage excitation potential supplying the alternating current amplifier and



the on-off control amplifier means whereby the effect of variations in the excitation potential is minimized.

11. A stabilized sensor circuit comprising a sensor device for sensing changes in a physical phenomenon being monitored and a constant current amplifier connected in series circuit relationship with the sensor device across a source of excitation potential, said constant current amplifier comprising a field effect transistor having drain, source and gate electrodes and a series connected feedback resistor connected in series circuit relationship with the drain-source electrodes, the feedback resistor being connected through a feedback connection back to the gate of the field effect transistor for maintaining constant current through the field effect transistor and the series connected feedback resistor, the series circuit comprised by the series connected feedback resistor and drain-source electrodes being connected in series circuit relationship with the sensor device.

3,887,782

EDM ELECTRODE VIBRATION CONTROL SYSTEM

Leonard M. Wohlabaugh, Miller Place, N.Y., assignor to Eltee Pulsitron (Entire), West Caldwell, N.J.

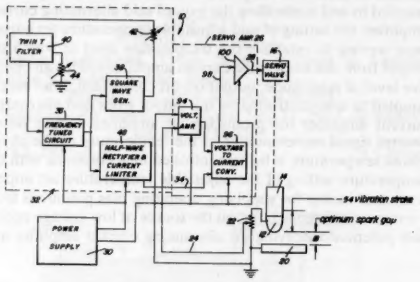
Filed Oct. 12, 1973, Ser. No. 406,091

Int. Cl. B23p *1/08*

U.S. Cl. 219—69 V **6 Claims**

5. In combination with a servo control system for effecting relative displacement between a workpiece and an electrode as a function of the spacing therebetween to maintain an optimum spark gap; a source of electrical oscillating signals, vibration generating means connecting said source to the servo control system for modulating said relative displacement between the electrode and workpiece with a vibratory motion of preselected frequency and amplitude, and stroke control means connected to the vibration generating means for substantially preventing any reduction in the spacing between the

workpiece and the electrode from a distance equal to that of the optimum spark gap, said stroke control means including



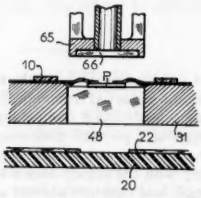
current limiting means connecting the source to the servo control system for rectifying the oscillating signal.

3,887,783

DEVICES FOR WELDING OF INTEGRATED-CIRCUIT WAFERS

Robert Comette, Rosny/Bois, France, assignor to Societe Honeywell Bull (Societe Anonyme), Paris, France

Filed June 12, 1973, Ser. No. 369,234
Claims priority, application France, Nov. 9, 1972, 72.39749
Int. Cl. B23k *1/02*
U.S. Cl. 219—85 **5 Claims**



1. A device for soldering to a substrate integrated circuit chips mounted previously on a carrier film, said film comprising a series of openings and a conductive sheet hot-rolled on one surface of said film, said sheet forming at each opening a plurality of flexible leads extending towards the center of said opening and bonded to a chip located in said center, said device comprising:

a first support plate for supporting said substrate,

a bonding head movable in a direction perpendicular to said plate,

means for displacing said head between a first position in which it is at a distance from said substrate and a second position in which it is in contact with said substrate,

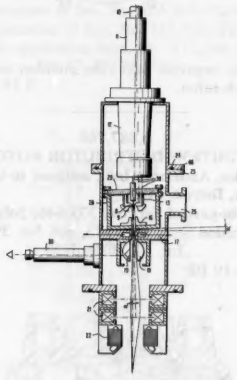
a second support plate, disposed between the first support plate and the bonding head when this latter is in its first position, for supporting the film having chips mounted thereon, said second support plate being provided with a die opening positioned on the bonding axis of the head, and means for adjusting successively each chip of the film on the bonding axis of the head, each adjusted chip overlying said die opening, said bonding head comprising a peen shaped to be engaged in said die opening for cutting the leads of the adjusted chip, when the bonding head is displaced from its first position to its second position for soldering to said substrate the remaining portions of the leads of said chip which, after this cutting-off has been completed, is carried by said peen to said substrate.

3,887,784

WELDING GUNS

Michel Alais, Orsay; Robert Caillot, Ezanville, and Francois Corcelle, Montlhery, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Division of Ser. No. 212,274, Dec. 27, 1971, abandoned. This application Feb. 6, 1973, Ser. No. 330,067
Int. Cl. B23k *15/00*
U.S. Cl. 219—121 EM **5 Claims**



1. In a method for welding a workpiece by electron bombardment of an operating plane of said workpiece, comprising generating by an electron gun having at least one electron beam geometry-influencing system an electron beam having a crossover point and having an elongated cross section, and impacting said operating plane by said electron beam; the improvement comprising inclining at an acute angle the geometrical axis of said beam relative to the axis of said influencing system before the beam is influenced by said system while keeping the crossover point of the beam approximately on the axis of said influencing system first acting upon the beam, said electron gun comprising two portions through which successively passes the electron beam before it is influenced by said influencing system, said two portions contacting each other along a curved sliding seat, and effecting said inclination of the geometrical axis of the beam by rotating one said portion relative to the other portion about an axis making a substantial angle with the direction of the electron beam between a Wehnelt cylinder and said beam geometry-influencing system, said rotation being effected by sliding one said portion along said sliding seat.

3,887,785

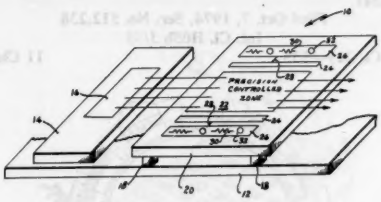
TEMPERATURE CONTROLLED HYBRID OVEN

Boyce T. Ahlport, Rolling Hills Estates, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 29, 1974, Ser. No. 501,724
Int. Cl. H05b *1/00*
U.S. Cl. 219—209 **1 Claim**

1. A temperature controlled hybrid oven for microcircuits comprising: a base; a plurality of thermally insulating glass piers positioned symmetrically on said base; a beryllia substrate mounted on said piers; a microcircuit mounted on the substrate; a pair of thin gold films deposited on said substrate adjacent to and opposite sides of said microcircuit for sensing

substrate temperature, and means for heating the microcircuit mounted on the substrate, connected to the said films whereby



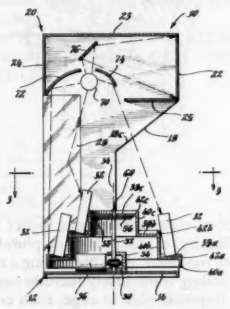
temperature changes in said substrate and microcircuit will be sensed and acted upon by the heating means.

3,887,786

MERCHANDISING DEVICE FOR MAINTAINING FOOD PRODUCT UNITS IN A UNIFORMLY HEATED CONDITION

Allan E. Witt, and Bernard G. Koether, both of Westport, Conn., assignors to Food Automation Service Techniques Inc., Stratford, Conn.

Filed Oct. 26, 1973, Ser. No. 409,797
Int. Cl. H05b *1/00*
U.S. Cl. 219—214 **7 Claims**



1. A merchandiser of the type arranged to store and display a group of food product units and to maintain the food product units in a heated condition during such storage and display, comprising:

a housing with an open front and means forming an upper housing portion,

carousel means visible through the open front of the housing and mounted within the housing for rotation about a vertical axis and having upper food supporting surfaces arranged to carry said group of food product units thereon,

the food supporting surfaces forming centrally elevated tiers for carrying food product units thereon for increased visibility and easier grasping thereof,

motor means for rotating said carousel means and the food product units on the upper food supporting surfaces thereof,

frictionally engaging slip clutch means for transmitting rotation from the motor means to the carousel means and for permitting the carousel means to be temporarily stopped from rotating without stopping the motor means, the slip clutch means having vertically separable elements removably mounting the carousel means within the housing for separation of the carousel means from the remainder of the merchandiser for cleaning, and

radiant heat lamp means mounted to the upper housing portion above the carousel means and being arranged to emit heat and light downwardly upon the food product units carried by the upper food supporting surfaces of the carousel means for illuminating the food product units for display and for maintaining the rotating food product units in a uniformly heated condition,

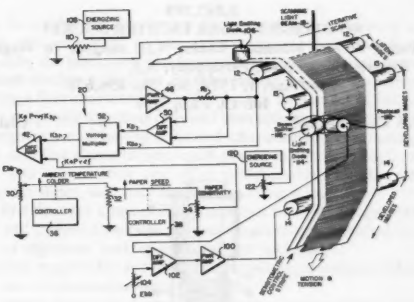
said radiant heat lamp means having a field of view substantially encompassing the food supporting surfaces of said carousel means, whereby each rotating food product unit thereon substantially continuously receives radiant heat, thereby increasing the uniformity of temperature of the food product units on the carousel means.

3,887,787

DRY PROCESS PHOTOGRAPHIC PAPER RECORDING APPARATUS

David Paul Gregg, Culver City, Calif., assignor to Del Mar Engineering Laboratories, Los Angeles, Calif.

Filed Oct. 3, 1974, Ser. No. 511,791
Int. Cl. H05b *1/00*
U.S. Cl. 219—216 **9 Claims**



1. Apparatus for developing a dry process photographic web, said web comprising a base of electrically conductive material and a light sensitive photographic emulsion on the base formed of materials capable of being developed by heat, said apparatus including: electrode means across which the web is drawn, and electrical circuit means connected to said electrode means for producing an electric power dissipation within the base of the web to cause internal developing heat to be generated thereby for the emulsion.

3,887,788

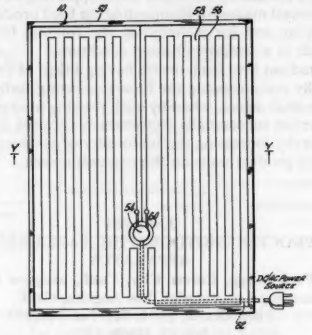
CONDENSATION FREE MIRROR

Richard Roy Seibel, Morganville, and Robert Rhea, Matawan, both of N.J., assignors to Seibel & Seibel Enterprises, Wickatunk, N.J.

Continuation-in-part of Ser. No. 297,286, Oct. 13, 1972. This application June 26, 1973, Ser. No. 373,770
Int. Cl. H05b *1/00*
U.S. Cl. 219—219 **5 Claims**

1. A condensation free mirror assembly comprising a transparent plate, a light reflective coating on one side of said plate, an electrically energizeable heating element consisting of a printed circuit board containing a ground path surrounding the perimeter of said board, a single continuous etched path of uniform thickness of a conductor material selected from the group consisting of copper, aluminum and Nichrome, a means for mounting said heating element to said transparent plate, a

means for supplying electrical power to said heating element whereby electrical power can be transmitted to said heating



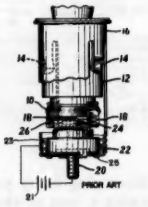
element from said electrical power means thereby energizing said heating element whereby said plate is heated.

3,887,789

NO-RELIGHT CIGAR LIGHTER SOCKET

Walter Pecota, Mountain Lakes, N.J., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed Apr. 1, 1974, Ser. No. 456,625
Int. Cl. F23q *7/24*
U.S. Cl. 219—265 **7 Claims**



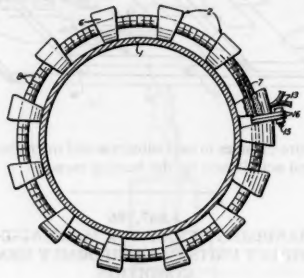
1. A no-relight cigar lighter socket comprising:
a. a metal socket housing;
b. an electrical stud secured to and electrically insulated from the socket housing;
c. a bimetallic thermostat affixed to said stud, said bimetallic thermostat being capable of retaining an electrical burner cup of a cigar lighter plug when the same is inserted therein;
d. a metal stop member affixed to said stud for limiting the maximum insertion of the burner cup of the cigar lighter plug;
e. said stop member being coated with an insulating material which electrically insulates the stop member from the burner cup when the burner cup is in its maximum inserted position thereby preventing the flow of electricity from the stop member to the burner cup when the burner cup is in contact with the stop member; and
f. said insulating material maintaining its electrical insulating properties at temperatures up to the maximum design operating temperature of the cigar lighter socket.

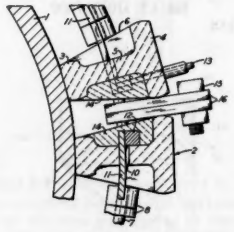
3,887,790

WRAP-AROUND ELECTRIC RESISTANCE HEATER

Vernon H. Ferguson, 3233 Kennebec Rd., Pittsburgh, Pa. 15241

Filed Oct. 7, 1974, Ser. No. 512,238
Int. Cl. H05b *3/58*
U.S. Cl. 219—535 **11 Claims**





1. A wrap-around electric resistance heater for heating an object surrounded by it, comprising a plurality of spaced parallel insulating rigid bars, each bar having a row of laterally spaced slots extending transversely therethrough, the slots in each row being disposed edge to edge, each end of each bar having a transverse passage therethrough, a tie wire extending through all of the passages at each end of the bars and provided with spacing means holding the bars spaced apart, laterally spaced flexible electric resistance ribbons extending through said slots in parallel relation, low resistance metal jumper means electrically connecting one end of each ribbon to the adjacent end of the next succeeding ribbon to form a zig zag electrical resistance element, electrical connections at the opposite ends of said element, and fastening means secured to the opposite ends of each tie wire for fastening those ends together after the heater has been wrapped around an object, whereby to hold the heater in place with said bars engaging said object.

3,887,791

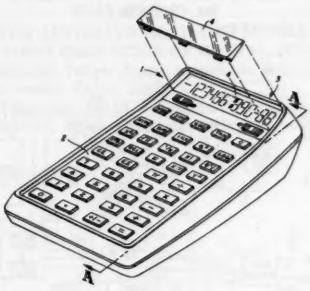
PRISMATIC DISPLAY WINDOW FOR A CALCULATOR

Lee Glen Kitchens, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 8, 1973, Ser. No. 414,004
Int. Cl. G06c *5/02*; **G06m** *1/22*
U.S. Cl. 235—1 D **6 Claims**

1. In a calculator system having a keyboard and having a visible output display contained in a casing for displaying visual data representations, the improvement comprising:
a. a display source, disposed substantially in the same plane as the keyboard; and

b. a prism attached to the casing for altering the angle of transmission of the visual data representations the transmission angle being acute with respect to the vertical plane.

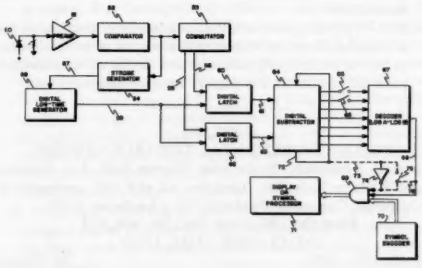


3,887,792

METHOD AND DEVICE FOR READING AND DECODING A DELTA-DISTANCE CODE

Richard E. Williams, Reston, Va., assignor to Scope Incorporated, Reston, Va.

Filed Dec. 4, 1973, Ser. No. 421,580
Int. Cl.[2] G06K *7/10;* **G08C** *9/06*
U.S. Cl. 235—61.11 E **13 Claims**



9. A device for scanning and decoding a multiple zone coded representation which includes two or more zonal dimensions bounded by three or more detectable transitions and in which a ratio of dimensions comprises coded data, comprising:

first means for scanning the representation and generating electrical signals which are an analog of the representation;

second means responsive to said first means for generating a plurality of signals substantialy coincident in time with the scan of said detectable transitions;

third means reponsive to said second means for generating and storing a plurality of signals respectively indicative of the logarithms of the times required to scan the representation between said detectable transitions;

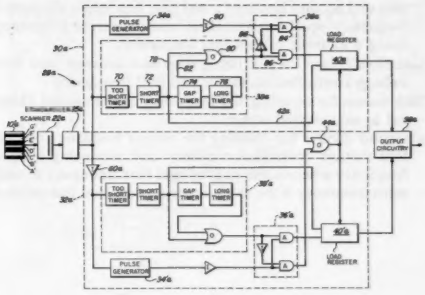
fourth means responsive to said third means for generating a unique signal corresponding to a categorization of a difference between predetermined members of said stored signals whereby the categorization defines a zone coded representation in terms of a dimensional ratio.

3,887,793

INTERSTITIAL CONTRASTING CODED MARK LABEL READING SYSTEM

Frank Carl Goodfinger, Randolph, and Richard H. Tuhro, Norwood, both of Mass., assignors to Computer Identics Corporation, Westwood, Mass.

Filed Jan. 11, 1974, Ser. No. 432,641
Int. Cl. G06k *7/10, 19/06;* **G08c** *9/06*
U.S. Cl. 235—61.11 E **9 Claims**



1. In a label reading system having means for scanning a label and providing signals representative of information borne by the label, a system for decoding signals derived from a label having a first set of information bearing segments having a first characteristic and at least a second set of information bearing segments disposed interstitially of said first set of segments and having a second characteristic contrasting with said first characteristic, each of said segments in each of said sets representing one of a predetermined number of different states, said decoding system comprising:

a first decoder channel responsive to a first set of segments and a second decoder channel responsive to a second set of segments, each of said channels including:

a load register for accumulating signals representative of a set of information bearing signals;

a timing circuit for establishing a recognition period for each of the predetermined number of different states and providing to said load register a data signal representative of that state during that period; and

a steering circuit, responsive to said timing circuit, for enabling a clock pulse to said load register to enter said data signal in response to a signal representative of a segment occurring during that period.

3,887,794

DOPPLER SHIFT COMPUTER

Louis Katz, Anaheim, and Lawrence Wells, Placentia, both of Calif., assignors to Electrac, Inc., Anaheim, Calif.

Filed Oct. 29, 1973, Ser. No. 408,201
Int. Cl. G06f *15/50;* **G01s** *9/42*
U.S. Cl. 235—151.3 **6 Claims**

1. A computer for calculating the amount the frequency in first and second RF channels has shifted while being transmitted from a first point to a second point wherein each received frequency at the second point is the sum of the transmitted frequency plus the doppler shift frequency plus the error shift frequency and the two transmitted frequencies are at a fixed ratio to each other, said computer comprising:

a first and a second adder for adding at least two frequencies inputted therein and outputting the sum,

first means for coupling the received frequency of said first channel to said first adder,

second means including a first voltage controlled oscillator and a first divider circuit for producing a first frequency that includes a reference frequency plus at least the transmitted and doppler frequencies of said one channel and

for coupling said first frequency to said first adder so that at least the reference frequency is outputted therefrom, thrid means of producing a second frequency that is substantially equal to the outputted frequency from said first adder

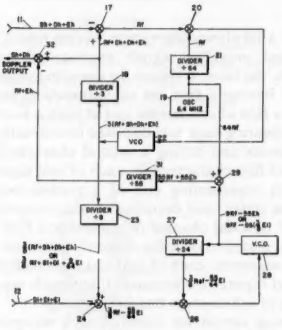
fourth means for comparing said second frequency and the outputted frequency from said first adder to produce a first voltage that is related to the phase difference between the frequencies,

said first voltage controlled oscillator being responsive to said first voltage to control its output frequency to maintain said second frequency and said first adder outputted frequency equal to each other and its output frequency being a multiple of said first frequency,

said first divider circuit being disposed between said first voltage controlled oscillator and said first adder,

fifth means for coupling the frequency of the second channel to said second adder,

a second divider for dividing the output frequency of said first voltage controlled oscillator and producing a third frequency wherein the ratio of said first frequency to said third frequency is the same as the ratio of said transmitted



frequencies and for coupling said third frequency to said second adder,

said second adder outputting a fourth frequency that includes the reference frequency multiplied by said ratio and a fraction of the value of the error frequency of said second channel,

sixth means including a second voltage controlled oscillator and a third divider having its input coupled to the output of said second oscillator for producing a fifth frequency that is substantially equal to said fourth frequency,

seventh means for comparing said fourth and fifth frequencies to produce a second voltage that is related to the phase difference of the frequencies and is coupled to the input of said second oscillator,

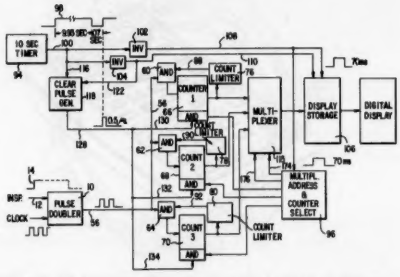
said second voltage controlled oscillator being responsive to said second voltage to control its output frequency to maintain said fifth frequency equal to said fourth frequency and the output frequency of said second oscillator being a fixed multiple of said fourth frequency, and

eighth means for coupling the output frequency of said second oscillator to the output frequency of said first oscillator so that the error frequency shift is removed from the outputted frequency of said first divider.

3,887,795
RESPIRATION RATEMETER

Theodore B. Eyrick, Reading, and Neil R. Hattes, Danvers, both of Mass., assignors to Chemetron Corporation, Chicago, Ill.

Filed Oct. 2, 1973, Ser. No. 402,678
Int. Cl. H03k *21/18*
U.S. Cl. 235—92 EA **12 Claims**



1. In a meter for counting pulses representing the rate occurrence of an event to be monitored and displaying a periodically updated accumulated count representing said rate of occurrence,

at least two counters each receiving and accumulating all of said pulses representing said event,

timer means generating a train of periodic timing pulses;

selector means responsive to said timing pulses for sequentially selecting said counters;

indicator means;

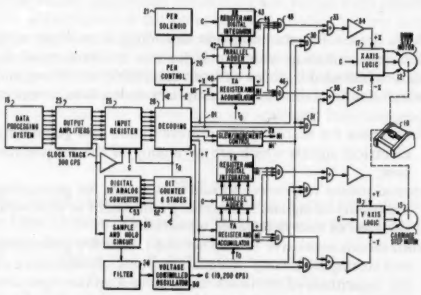
means responsive to said timing pulses for transferring the accumulated count in a selected counter to said indicator means; and

means for clearing said selected counter after transfer of the accumulated count, whereby the output of each counter in turn is periodically selected and displayed to provide a periodic update in the display representing said rate.

3,887,796
DIGITAL INCREMENTAL CONTROL SYSTEM

Robert B. Trousdale, Santa Ana; Eugene Seid, Los Angeles, and William E. Smith, Anaheim, all of Calif., assignors to California Computer Products, Inc., Anaheim, Calif.

Filed Oct. 26, 1964, Ser. No. 406,523
Int. Cl. G06k *15/22, 17/00*
U.S. Cl. 235—151 **29 Claims**



1. The method of providing digital incremental graphical plots from a data processor which includes the steps of providing distance increment and velocity increment commands in separate series from the data processor, operating a plotter at

rates synchronized with distance increment commands as they are provided in one series, and operating the plotter at rates which vary with time in accordance with the velocity increment commands as they are provided in the other series.

3,887,797

DEVICE FOR AUTOMATICALLY ADJUSTING FAULT NULL POINT INDICATION OF DIGITAL SCALE

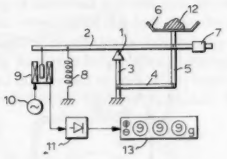
Yuzuru Nishiguchi, Tokyo, Japan, assignor to Shinko Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 26, 1973, Ser. No. 400,816

Claims priority, application Japan, Oct. 14, 1972, 47-102944

Int. Cl. G01g *19/00*

U.S. Cl. 235—151.33 **3 Claims**



1. In a digital scale system of the type having a digital voltmeter to which an input voltage proportional to a measured weight of an object is provided from an electric transducer consisting of a weighing system, and a device for automatically adjusting a faulty numeral indication at the null point to the exact 0, said device comprising:

a calculator operatively coupled to and receiving two kinds of electric signals from said digital voltmeter, one being a signal for distinguishing whether the polarity of the indication on the digital voltmeter is (+) or (−), and the other being for distinguishing whether said indication is within or without the preset slight numeral range, a positive (+) output signal being produced by said calculator where the indication of (+) polarity falls within the preset numeral range, a negative output signal being produced by said calculator when the indication of (−) polarity falls within the preset slight range, and an output of 0 being produced independent of said distinguished polarity when the indication falls without the preset slight range; and

an integrator coupled to said calculator for receiving the output signal thereof and coupled to said transducer for feeding back its output to one of a mechanical and electric means in said electric transducer until the indication of said digital voltmeter becomes correct 0 at the null point.

3,887,798

GENERATOR OF PULSE TRAINS CORRESPONDING TO WALSH FUNCTIONS

Girolamo DeVincentiis, San Mauro Torinese, and Angelo Luvison, all of Turin, Italy, assignors to CSELT-Centro Studi E Laboratori Telecomunicazioni s.p.a., Torino, Italy

Filed Dec. 17, 1973, Ser. No. 425,132

Int. Cl. H03k *13/24*

U.S. Cl. 235—152 **8 Claims**

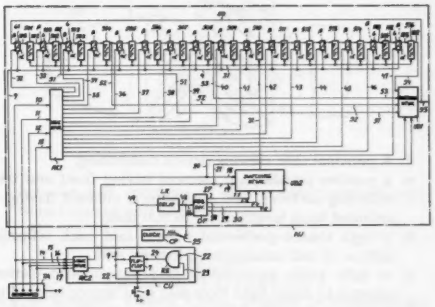
1. A system for generating, on an outgoing line, binary pulse trains with assigned numerical values ranging from 1 through $m-1$ with $m = 2^{k+1}$, k being an integer greater than 1, comprising:

logical circuitry with k+1 input leads and with at least $m-2$ output leads for converting a chosen binary number, represented by selective energization of said input leads, into an equivalent Walsh function represented by energization of certain of said output leads;

memory means with m stages, at least $m-2$ of said stages being provided with loading connections to respective output leads of said circuitry;

a source of $k+1$ pulse sequences with repetition frequencies subharmonically related to a basic pulse frequency f;

first switching means connected to said input leads for determining from the energization pattern thereof the



rank p of the highest-ranking finite bit of the chosen binary number and for completing an output connection to said outgoing line for the serial read-out of a group of 2^p consecutive stages of said memory means; and

second switching means connected to said source for applying a pulse sequence of repetition frequency $f/2^{k+1-p}$ to respective stepping inputs of said group of 2^p stages.

3,887,799

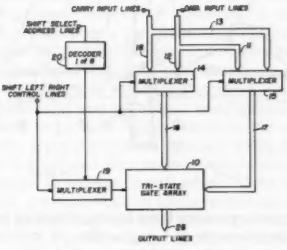
ASYNCHRONOUS N BIT POSITION DATA SHIFTER

Theodore P. Lindgren, 4653 Lisann, San Diego, Calif. 92117

Filed Dec. 3, 1973, Ser. No. 421,366

Int. Cl. G06f *7/00*

U.S. Cl. 235—164 **4 Claims**



1. An asynchronous data bit shifter for shifting a data word to the left or right depending on the value of the shift select word said shifter comprising:

a. a first input means for receiving a carry signal input,

b. a second input means for receiving a data signal input,

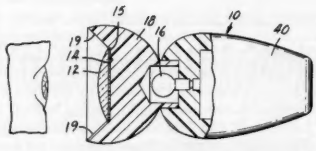
c. a third input means for receiving a control signal input,

d. a matrix of tri-state gates, one-half of said gates having their inputs connected to said second input means and the other half of said gates having their inputs connected to said first input means, the control elements of said gates being coupled to said third input means so that input data coupled to said first and second input means can be asynchronously shifted right and left in response to a command signal applied to said third input means.

3,887,800
PERSONAL CARE VIEWER

Dee Lynn Johnson, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 19, 1973, Ser. No. 426,119
Int. Cl. F21
U.S. Cl. 240—1 EL 13 Claims

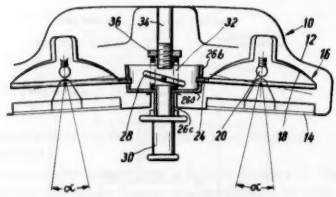


1. A personal care viewing device comprising:
a. a positive catadioptric element having front and back reflecting surfaces, said catadioptric element having an unfolded focal length of 50 to 500 mm;
b. a light source positioned behind said back reflecting surface of said catadioptric element; and
c. a light guide surrounding said catadioptric element adapted to direct light from said light source beyond the periphery of said catadioptric element and from said back reflecting surface in a diffuse pattern into the space adjacent to said front surface of said catadioptric element.

3,887,801
SURGICAL OPERATING LAMP WITH INDIVIDUAL SPOT-LIGHTS

Karl F. Ilzig, Hanau; Klaus M. Junginger, Rodenbach, and Alois Rieth, Offenbach-Bieber, all of Germany, assignors to Original Hanau Quarzlampen GmbH, D-6450 Hanau, Germany

Filed Jan. 24, 1974, Ser. No. 436,256
Claims priority, application Germany, Feb. 6, 1973, 2305666
Int. Cl. A61g *13/00*; F21v *33/00*
U.S. Cl. 240—1.4 7 Claims

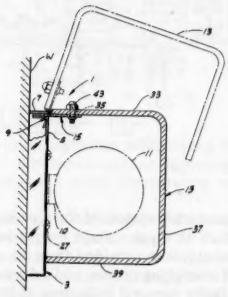


1. In a surgical operating lamp having a housing with at least one hole therethrough and a plurality of individual lights pivotally mounted within said housing and disposed about a central axis of the lamp such that the rays of each individual light meet on the central axis at a desired distance from the lamp, the improved lamp pivoting means comprising
a. cam means within the housing having an annular intermediate wall oriented perpendicular to the central axis of the lamp, an upper wall attached to the outer periphery of said annular intermediate wall and extending in a first direction, said upper wall having a plurality of slots therethrough defining a plurality of cam surfaces, the longitudinal axes of said slots inclined with respect to the central axis of said lamp, and a lower wall attached to the inner periphery of said annular intermediate wall and extending in a direction opposite that of said upper wall, said lower wall pivotally extending through the hole in said lamp housing;
b. a handle attached to said lower wall and extending exteriorly of said lamp housing; and
c. pins affixed to each individual light and bearing on one of the cam surface of said cam means, such that rotation of said handle produces a corresponding rotation of said cam means which thereby causes said lights to pivot about an axis tangent to a common circle drawn about the central axis of the surgical operating lamp.

3,887,802
WALL-MOUNTED LIGHTING FIXTURE

Charles D. Goralnik, 200 Brynwyck Pl., St. Louis County, Mo. 63141

Filed May 20, 1974, Ser. No. 471,788
Int. Cl. F21s *1/02, 3/02, 5/00*
U.S. Cl. 240—73 LD 27 Claims



1. A wall-mounted lighting fixture comprising a mounting base adapted to be secured to a wall, said mounting base having a generally vertical front wall, an adjoining generally horizontal top wall and at least one generally horizontal slot in the front wall adjacent said top wall, said fixture further comprising lighting means carried by the front wall of said mounting base, a light transmitting shade, and at least one hinge means mounting said shade on said mounting base for movement between a lowered operating position in which said shade effectively shades said lighting means and a raised position in which said lighting means is readily accessible, said hinge means comprising a hinge member having a generally flat leg portion insertable into said slot from the back side of said mounting base, a head portion engageable with the inner face of said front wall to prevent said hinge from passing through said slot, and retaining means for holding the hinge captive relative to the mounting base, said hinge member being swingable between a first position in which the lower surface of said leg portion is in engagement with an edge of said front wall, said edge constituting at least a portion of the lower surface of said slot, for supporting said shade in its operating position and a second position in which said shade is supported in its raised position, at least a portion of said retaining means being on the opposite side of said front wall of said base from said head portion.

3,887,803
LIGHT EMITTING DIODE DEVICE

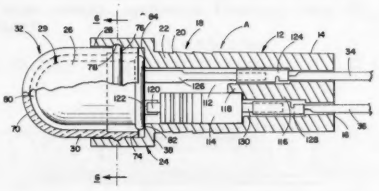
John M. Savage, Jr., Los Angeles, Calif.

Filed May 28, 1974, Ser. No. 474,094
Int. Cl.[2] F21V *17/00*; G09F *9/14*
U.S. Cl. 240—151 17 Claims

1. A light emitting diode device comprising an outer housing, said housing having a longitudinally elongated body and an enlarged head connected to said body, said head having an interiorly presented wall forming a socket therein, a lens having an outer section and an annular skirt section projecting from said outer section, said skirt section removably extending within said socket, recess means formed in said interiorly

presented wall, and somewhat resilient projecting locking means on said skirt section sized and fitting within said recess means when said skirt section is introduced into said socket for removably retaining said lens on said outer housing, a light emitting diode received within said lens and extending radially inwardly of said recess means, the diode having a longitudinally elongated terminal and a relatively short terminal, both said terminals projecting within a hollow formed by said housing elongated body, a resistor positioned in said hollow by said body and in endwise alignment with said diode relatively short terminal, said resistor having a conductive tab and a terminal at longitudinally opposite ends thereof, said tab integrally connected to the diode relatively short terminal whereby the diode is positioned relative to the housing and lens by the resistor, there being electrically conductive clips in the housing removably longitudinally receiving and engaging the diode elongated terminal and the resistor terminal, whereby the diode and resistor may be longitudinally removed as a unit from the housing or returned as a unit into the housing via said socket after prior removal of the lens therefrom.

15. A light emitting diode device comprising an outer housing, said housing having a longitudinally elongated body and an enlarged head connected to said body, said head having an interiorly presented wall forming a socket therein, a lens



having an outer section and an annular skirt section projecting from said outer section, said skirt section removably extending within said socket, recess means formed in said interiorly presented wall, and somewhat resilient projecting locking means on said skirt section sized and fitting within said recess means when said skirt section is introduced into said socket for removable retaining said lens on said outer housing, a light emitting diode received within said lens and extending radially inwardly of said recess means, there being longitudinally elongated terminals of different lengths connected with the diode, there also being electrically conductive clips in the housing removably longitudinally receiving and engaging said terminals, one of said clips being located sufficiently closer to said socket than the other clip that the terminal normally received by said other clip cannot be sufficiently longitudinally received by said one clip to allow reception of the remaining terminal by said other clip.

3,887,804

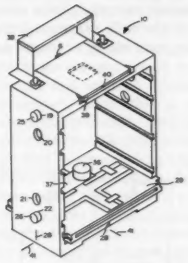
RADIOGRAPHIC TEST STAND

Tommie J. Morgan; George I. Coats; Richard W. Kisielewski, and Charles K. Showalter, all of Rockville, Md., assignors to The United States of America as represented by the Secretary of the Department of Health, Education & Welfare, Washington, D.C.

Filed Dec. 3, 1973, Ser. No. 420,977
Int. Cl. G03b *41/16*
U.S. Cl. 250—252 **13 Claims**

1. A test stand for maintaining fixed geometry during X-ray imaging, comprising:

a substantially rectangular frame open at the front and back having substantially aligned first and second apertures in two opposing sides, first slide receiving means associated with each of said apertures for receiving and positioning a slide assembly over said apertures, and a plurality of second slide receiving means in two opposing sides of said frame other than those sides having said apertures for receiving and positioning a slide assembly parallel to and



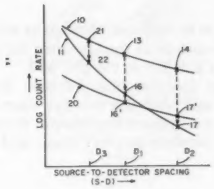
between said apertures at various predetermined positions between said apertures.

3,887,805

MEASURING APPARATUS

Nick A. Schuster, Darien, Conn., assignor to Schlumberger Limited, New York, N.Y.

Continuation of Ser. No. 64,846, July 29, 1970, abandoned, which is a division of Ser. No. 686,404, Nov. 29, 1967, Pat. No. 3,546,454. This application Apr. 16, 1973, Ser. No. 351,230
Int. Cl. G01t *1/16*
U.S. Cl. 250—264 **20 Claims**



1. A borehole logging system for measuring the porosity of an earth formation comprising a housing, a first neutron source within said housing for establishing a neutron distribution in which the neutron intensity decreases with increasing separation from said source at rates that correspond to the formation and borehole conditions, a short-spaced neutron detector within said housing spaced from said source a sufficient distance to produce signals related to the earth formation porosity, a second neutron detector within said housing positioned beyond said first neutron source and said short-spaced detector to produce signals related to the earth formation porosity, a second neutron source within said housing for establishing an individual neutron distribution that characterizes the formation and borehole conditions, said second neutron source positioned within said housing adjacent to said second neutron detector a sufficiently short distance to at least a portion of said neutron detector to compensate said detector for the borehole conditions.

3,887,806

FAULTY CAN DETECTOR

John J. Rodak, Southampton, and Robert L. Macheski, Warminster, both of Pa., assignors to Crown Cork & Seal Co., Inc., Philadelphia, Pa.

Filed Oct. 9, 1973, Ser. No. 404,784
Int. Cl. H01j *39/12*
U.S. Cl. 250—223 B **7 Claims**

1. Faulty can detector apparatus for detecting roll back and other defective can conditions comprising:

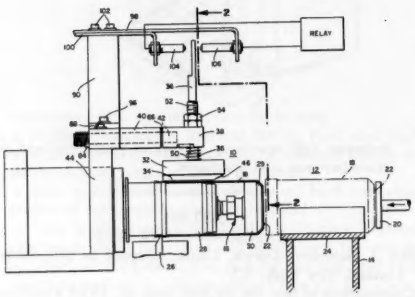
means for rotating the can about the longitudinal axis thereof;

a detector shoe having a surface positioned in close proximity to the rotating can;

a pivot flag member extending from said detector shoe;

support means to pivotally secure said pivot flag at an intermediate pivot point along its length so as to permit said detector shoe to be deflected through an arc substantially tangent to the surface of the can when the detector shoe is deflected by a defect in the can; and

a sensing means for detecting defective can conditions actuatable by said pivot flag member when the defective portion of the can impacts the detector shoe thus causing the pivot flag member to pivot about said intermediate pivot point.



3,887,807

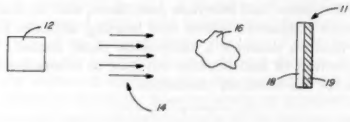
ELEMENTS AND PROCESS FOR RECORDING DIRECT IMAGE NEUTRON RADIOGRAPHS

Robert V. Poignant, Jr., and Edwin P. Przybylowicz, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 20, 1973, Ser. No. 381,106

Int. Cl. G01z *3/00*

U.S. Cl. 250—315 **22 Claims**



1. An element for reducing a direct image neutron radiograph, said element being capable of holding an electrostatic charge and comprising means for absorbing neutrons and generating a current by dissipation of said electrostatic charge in proportion to the number of neutrons absorbed, said neutron absorbing means comprising an insulative layer comprising a neutron absorbing agent in a concentration of at least 10^{17} atoms per cubic centimeter.

3,887,808

THERMOIMAGING PROCESS UTILIZING A PHOTOCHROMIC MATERIAL CONTAINING A SPIROPYRAN, A POLYHALOGENATED HYDROCARBON, A THIOL COMPOUND AND A POLYVINYLCARBAZOLE

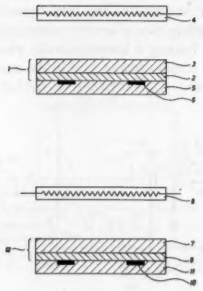
Jozef Willy Van den Houte, Berchem; Freddy Ghisleen Van Royen, Wommelgem; Hugo Vital Van Goethem, Edegem, and Edwin Hendrik Hazenbosch, Mechelen, all of Belgium, assignors to Agfa-Gevaert, Mortsel, Belgium

Filed June 25, 1973, Ser. No. 372,938

Claims priority, application United Kingdom, June 26, 1972, 29915/72

Int. Cl. G03c *5/04, 1/52*

U.S. Cl. 250—316 **15 Claims**



1. A process for forming a dye image comprising applying a heat pattern having a temperature of at least **90°C** of the image in the presence of minor amounts of about up to **20%** of visible light to a recording material including a recording layer containing an intimate mixture comprising:

1. at least one spiropyran compound of the group consisting of a spirodibenzopyran, a spirodinaphthopyran, a spirobenzonaphthopyran, a 1,3,3-trimethylindolinobenzospiropyran, a 1,3,3-trimethylindoline-naphthospiropyran, or a spiropyran that contains a condensed aromatic nucleus of anthracene or phenanthrene, and
2. at least one ultra-violet radiation-sensitive polyhalogen compound capable of producing on exposure with ultraviolet radiation with the spiropyran compound a dye salt and having the general formula:

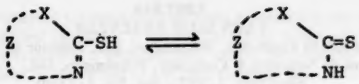
wherein:

each of A, B, X and Y is a chlorine, bromine or iodine atom, or

one of said groups A, B, X or Y is an alkyl group, an aryl group or an aroyl group and the other groups are each chlorine, bromine, or iodine, or two of said groups A, B, X or Y each is an aromatic acyl group and the other groups chlorine, bromine, or iodine,

and in working relation with said mixture at least one of the following compounds,

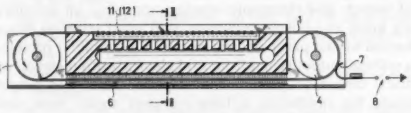
a. a tautomeric organic nitrogen containing compound corresponding to the following general formula:



in which:
X represents oxygen, sulphur, selenium or the group

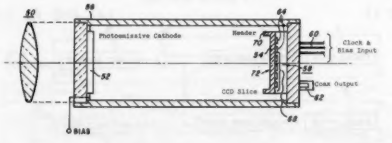
in which R is hydrogen, or an alkyl, allyl, or phenyl group, and
Z represent the necessary atoms to close a 5- or 6-membered heterocyclic nitrogen-containing ring system, and
b. a polymer containing N-vinylcarbazole units.

3,887,809
CORONA DISCHARGE DEVICE
Gerhard Marx, Hahn/Taunus, and Hermann Frank, Sulzbach, both of Germany, assignors to Hoechst Aktiengesellschaft, Wiesbaden-Biebrich, Germany
Filed Nov. 14, 1974, Ser. No. 523,751
Claims priority, application Germany, June 22, 1972, 2230483
Int. Cl. G03g *15/00*
U.S. Cl. 250—324 **25 Claims**



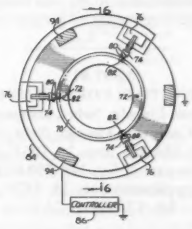
1. A corona discharge device comprising an endless movable belt as at least one corona discharge element, said belt having at least one conductive layer at two discharge edges of the belt, a row of supported electrodes facing each discharge edge a uniform distance therefrom for a portion of said belt which with said portion form a discharge zone and a cleaning device through which said belt moves positioned outside of the discharge zone and extending along said belt.

3,887,810
PHOTON-MULTIPLIER IMAGING SYSTEM
Frank Lee Skaggs, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Jan. 2, 1973, Ser. No. 320,392
Int. Cl. H01j *31/50;* **G01t** *1/16*
U.S. Cl. 250—333 **10 Claims**



1. A high gain semiconductor charge transfer device imager comprising a proximity tube including a substantially planar photo-emissive cathode for emitting a number of electrons corresponding to the intensity of visible radiation from an image focused thereon, the density pattern of emitted electrons substantially corresponding to the light intensity pattern of said image; an array of semiconductor charge transfer device storage elements defined on a first planar surface of a semiconductor anode spaced from said cathode, said anode defining a second planar impact ionization surface facing said cathode, said second surface defining a recess in registry with the region on said first planar surface wherein said array is defined, said recessed region defining a thickness of said semiconductor anode effective to minimize lateral spread of charge; means for biasing said anode and cathode to accelerate said emitted electrons to a higher energy and for impacting said accelerated electrons on said anode in substantially the same density pattern as said emitted electrons, said accelerated electrons respectively generating a plurality of hole-electron pairs in said semiconductor anode thereby providing substantial gain, said electron-hole pairs effectively modifying the charge of respective corresponding storage elements of said array, the pattern of said modified charge in said array substantially conforming to said density pattern of emitted electrons; and output means for addressing said array and selectively detecting the charge stored in each of said storage elements to provide an amplified output signal corresponding to said image.

3,887,811
ELECTRO MECHANICAL ALIGNMENT APPARATUS FOR ELECTRON IMAGE PROJECTION SYSTEMS
William R. Livesay, Camarillo, Calif., assignor to Radiant Energy Systems, Inc., Newbury Park, Calif.
Continuation of Ser. No. 187,799, Oct. 8, 1971, abandoned. This application Nov. 8, 1973, Ser. No. 413,815
Int. Cl. H01j *37/20*
U.S. Cl. 250—442 **12 Claims**



1. An angular alignment system for electron image projection systems comprising:
first means for supporting a photocathode;
second means for supporting an article to receive an electron image emitted from the photocathode; and
a plurality of piezoelectric means disposed between and attached to said first and second means, for inducing relative rotation between said first and second means according to the magnitude and polarity of a control voltage applied to said piezoelectric means to cause dimensional distortion thereof, and for providing the sole support for the weight of one of said first and second means with respect to the other, thereby allowing substantially friction-free and hysteresis-free relative rotation.

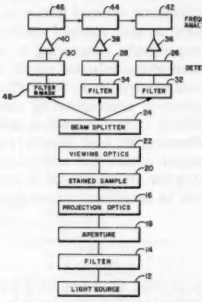
3,887,812
METHOD AND APPARATUS FOR DETECTING AND CLASSIFYING NUCLEIC ACID PARTICLES
Tomas Hirschfeld, Framingham, Mass., assignor to Block Engineering, Inc., Cambridge, Mass.
Continuation-in-part of Ser. No. 375,807, July 2, 1973. This application July 29, 1974, Ser. No. 492,501
Int. Cl. G01t *1/16*
U.S. Cl. 250—458 **4 Claims**

1. Apparatus for detecting and classifying, in a fluid specimen, submicron-dimensioned particles containing a nucleic acid and stained with a fluorescent dye specific to said nucleic acid, said apparatus comprising,

a radiation source for providing illumination within an excitation band of said dye,

means for directing said illumination into said specimen,

means for viewing fluorescence emission produced from said dye responsively to said illumination, and



means for spatially filtering at least one of said illumination and said fluorescence emission, said means for spatially filtering comprising aperture means providing, in conjunction with said means for viewing, a ratio of viewed volume of said specimen to the root mean square distance across said aperture means of greater than 1000/1.

3,887,813

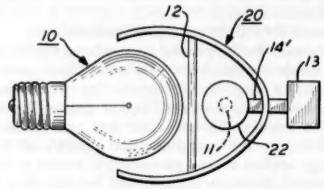
SHORT WAVELENGTH FLUORESCENT LIGHT SOURCE

Robert W. Allington, Lincoln, Nebr., assignor to Instrumentation Specialties Company, Lincoln, Nebr.

Division of Ser. No. 654,303, June 26, 1967, abandoned, which is a continuation-in-part of Ser. No. 590,071, Oct. 27, 1966, abandoned. This application July 24, 1970, Ser. No. 64,863

Int. Cl.[2] G01N *21/38*

U.S. Cl. 250—461 **14 Claims**



1. A source of ultraviolet illumination for use in photometric apparatus, comprising:

primary source means for radiating ultraviolet light in at least one direction;

fluorescent means, positioned in said one direction from said primary source means, for emitting light along at least one path having at least some wavelengths substantially within the range of about **270** to **320** millimicrons upon receiving said ultraviolet light from said primary source means;

said fluorescent means including an article of thallium-activated alkali halide;

said photometric apparatus including a flow cell positioned in said one path, whereby light from said fluorescent means is directed into said flow cell.

3,887,814

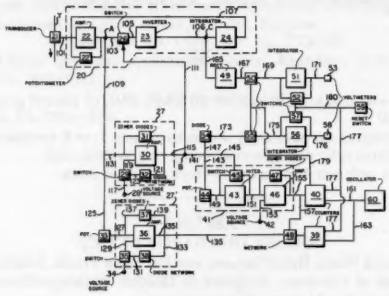
YARN SLUB ANALYZER

Mark Edwin Faulhaber, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Nov. 1, 1973, Ser. No. 412,040

Int. Cl.[2] G01N *21/32*

U.S. Cl. 250—562 **7 Claims**



5. In a yarn inspection system wherein yarn moves at a uniform rate past a photoelectric means for generating an electric signal output corresponding to instantaneous variations in yarn diameter and including electronic means responsive to said photoelectric means for processing said electric signal output, said electronic means comprising: an amplifier having input and output terminals, said input terminal being connected to said photoelectric means, said amplifier producing a voltage output signal from said electric output signal; an electrical circuit coupled to the amplifier input and output terminals for producing a time-averaged signal from said voltage output signal and for feeding said time-averaged signal back to the input terminal; means for maintaining said time-averaged signal constant and for providing an indication signal when said voltage output signal exceeds a predetermined minimum threshold value; means for establishing said minimum threshold value; and means for measuring the duration of said indication signal and signaling each instance said duration exceeds a predetermined minimum time during a preselected period of time.

3,887,815

PHOTOELECTRIC SMOKE DETECTOR

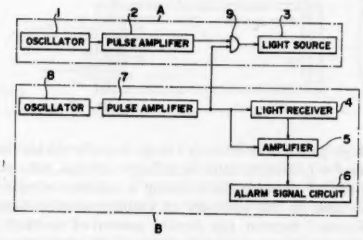
Mamoru Kawakami, Takatsuki, Japan, assignor to Hochiki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1973, Ser. No. 423,530

Claims priority, application Japan, Dec. 14, 1972, 47-142726

Int. Cl. H01j *39/12*

U.S. Cl. 250—564 **3 Claims**



1. A photoelectric smoke detector comprising a source of light, a first oscillator connected to said source, said source

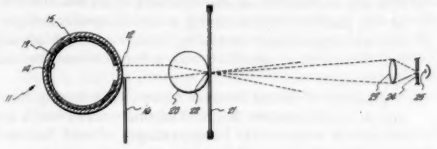
being adapted for being intermittently energized by the output of said first oscillator, a second oscillator, a light receiving circuit including a photoelectric means adapted for being energized by the output of a second oscillator thereby to come into operation intermittently for receiving light scattered by smoke generated by the source of light, the first and second oscillators having different oscillation periods, and an AND gate circuit controlled by the outputs of the first and second oscillators being connected between the first oscillator and the source of light.

3,887,816

OPTICAL SYSTEM FOR X-RAY SCANNING EQUIPMENT

Austin G. Cooley, Reno, Nev., assignor to Litton Medical Products, Inc., Elk Grove, Ill.

Filed Apr. 26, 1973, Ser. No. 354,671
Int. Cl. G01n *21/06, 21/22*
U.S. Cl. 250—571 **7 Claims**



1. In combination:

an x-ray film station having a plane for receiving a frame of x-ray film;

an exciter lamp positioned on one side of said x-ray film station for illuminating a thin line of illumination across the x-ray film;

an aperture plate positioned on the opposite side of said film station;

an objective lens positioned between said film station and aperture plate for focusing the scanned image from said film station onto said aperture plate;

photosensitive means positioned behind said aperture plate for receiving the light signals passing through said aperture plate and generating electrical signals in response thereto;

lens means positioned between said exciter lamp and said film station for diverging the spectral light passing therethrough and increasing the luminance of the illuminated line passing therethrough, said lens means including a cylindrical lens longitudinally positioned adjacent said film station; and

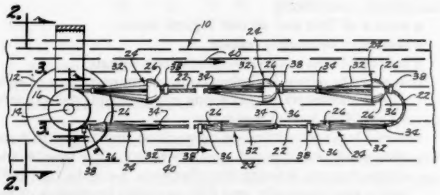
means for attenuating portions of the illuminated line exiting said exciter lamp.

3,887,817

POWER GENERATING DEVICE

Gerald E. Steelman, R.R. 3, Adel, Iowa 50003

Filed Dec. 20, 1973, Ser. No. 426,804
Int. Cl. F03b *13/10*
U.S. Cl. 290—43 **11 Claims**



1. A power generating device comprising:

a frame;

a continuous elongated flexible loop member adapted to be suspended in a current of moving fluid, said loop member having opposite end loop portions and including a plurality of flexible and collapsible containers;

each of said containers being comprised of a flexible material which is free to collapse radially inwardly towards the longitudinal axis of said loop member;

each of said flexible containers having an open end and a closed end, each of said containers being adapted to open and to capture and hold a quantity of fluid when said open end extends towards an oncoming current of fluid, and being adapted to collapse and empty said quantity of fluid when said closed end extends towards an oncoming current,

a rotatable member rotatably mounted to said frame;

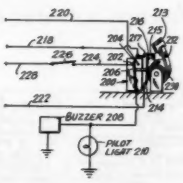
and one end loop portion of said loop member embracing said rotatable member, whereupon movement of said loop member by a moving current of fluid will impart rotational movement to said rotatable member.

3,887,818

MOTOR VEHICLE EQUIPMENT

Jesse R. Hollins, 40 Stoner Ave., Great Neck, N.Y. 11021

Filed Dec. 26, 1972, Ser. No. 318,377
Int. Cl. B60r *25/10*
U.S. Cl. 307—10 SB **4 Claims**



1. Motor vehicle equipment comprising an ignition key receiving lock cylinder, a conducting arm, a conducting arm mover element, a switch first contact, a switch second contact, said conducting arm biased to touch said switch second contact, means for moving said conducting arm mover element so that said conducting arm is in circuit with said switch first contact when an ignition key is in said ignition key receiving lock cylinder, an ignition ON contact, a source of electrical power, said source of electrical power connected to said conducting arm, means for selectively connecting said source of electrical power to said ignition ON contact, a seat belt assembly including a retractable belt, a warning device and means for activating said warning device when said source of power is electrically coupled via said conducting arm to said switch second contact and said belt is unretracted and for deactivating said warning device when said belt is retracted.

3,887,819

SAFETY DEVICE ACTUATING ARRANGEMENT

Yoshiya Kurasawa, Yokohama, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed Sept. 25, 1973, Ser. No. 400,615
Claims priority, application Japan, Sept. 26, 1972, 47-112123
Int. Cl. B60q *1/52*
U.S. Cl. 307—10 R **1 Claim**

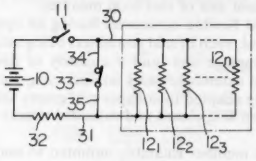
1. A safety device actuating arrangement for actuating a safety device of a motor vehicle, which comprises:

at least one actuator for the safety device when energized;

a normally-open deceleration rate detecting switch for connecting said actuator to a power source so as to energize said at least one actuator when it is subjected to a deceleration rate greater than a predetermined magnitude; and

a normally-closed mechanical pressure detecting switch connected in parallel with said at least one actuator and

in series, through a resistor, with said deceleration rate detecting switch, said mechanical pressure detecting



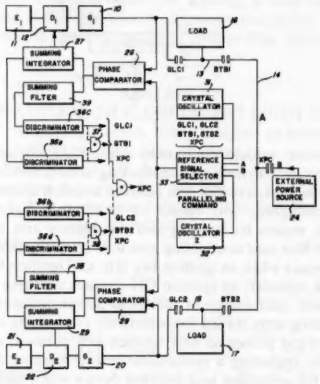
switch being opened when a mechanical pressure is applied thereto.

3,887,820

PARALLELING CONTROL FOR PHASE SYNCHRONIZED GENERATORS

Timothy F. Glennon, Rockford, Ill., assignor to Sunstrand Corporation, Rockford, Ill.

Filed Mar. 29, 1974, Ser. No. 456,310
Int. Cl. H03k *5/20*
U.S. Cl. 307—87 **12 Claims**



1. In an electrical power generation and distribution system having a first electrical power source including a generator having an alternating current output, the generator being powered by a variable speed engine through a constant speed drive, a second electrical power source having an alternating current output and switch means for connecting the outputs of the two sources in parallel, a paralleling control comprising:

means providing an alternating current phase reference signal, the phase of which corresponds with that of said second alternating current source;

means for comparing the phase of the output of said first source generator with the phase of said reference signal;

means responsive to the phase comparator for developing a cumulative phase difference signal which is connected with said constant speed drive to phase synchronize the first source generator with the reference signal; and

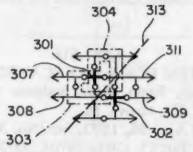
means responsive to the phase comparator for actuating said switch means to connect the electrical source outputs in parallel, when the phase difference between the first source generator and the reference signal is within selected limits.

3,887,821

POWER TRANSMISSION SUBSTATION ARRANGEMENT

John M. Stipcevich, 114 Hampton Rd., Collingswood, N.J. 08108

Filed May 20, 1974, Ser. No. 471,597
Int. Cl. H02b *1/20*
U.S. Cl. 307—112 **10 Claims**



1. Electrical power substation apparatus comprising:

a. first and second bus means separated by an axis therebetween, each bus means having a central conductive portion and appendages extending therefrom, each of said bus means being identified with a zone defined by said appendages;

b. a plurality of circuit breaker means, each having three circuit breaker means, first and second ones of which are connected respectively to appendages of said first and second bus means; and

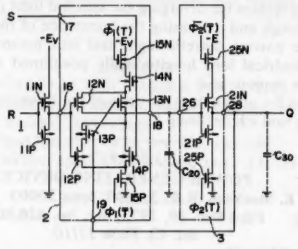
c. a plurality of electrical lines, each being connected to a third breaker switch of one of said breaker means and to one other breaker switch of the same one of said breaker means, each of said lines being located exclusively of the zones identified with said first and second bus means.

3,887,822

FLIP-FLOP CIRCUITS UTILIZING INSULATED GATE FIELD EFFECT TRANSISTORS

Yasoji Suzuki, Kawasaki, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Aug. 3, 1973, Ser. No. 385,247
Claims priority, application Japan, Aug. 31, 1972, 47-87457
Int. Cl. H03k *3/286, 3/33, 19/08*
U.S. Cl. 307—279 **24 Claims**



1. A flip-flop circuit utilizing insulated gate field effect transistors, comprising:

a source of first and second logical inputs;

a source of operating voltage;

a source of first complementary clock signals;

first inverter means including a complementary pair of field effect transistors for receiving and reversing the polarity of said first logical input;

delayed logic circuit means comprising first to fourth transistors of one channel type each including source and drain regions defining therebetween a conduction path and a gate electrode, and fifth to eighth transistors of the other channel type each including source and drain regions defining therebetween a conduction path and a gate electrode, the conduction paths of said first and second transistors being coupled in parallel, the conduction path

of said third transistor being connected in series with that of said first transistor, the conduction paths of said fifth and sixth transistors being connected in series, the conduction path of said seventh transistor being connected in parallel with serially connected conduction paths of said fifth and sixth transistors, the conduction path of said second transistor being connected in series with that of said seventh transistor, the conduction path of said fourth transistor being connected between the conduction path of said third transistor and one terminal of said source of operating voltage, the conduction path of said eighth transistor being connected between the conduction path of said fifth transistor and the other terminal of said source of operating voltage, the gate electrodes of said first and fifth transistors being connected in common to receive the output of said first inverter means, the gate electrodes of said second and sixth transistors being connected in common to receive an output of said flip-flop circuit, the gate electrodes of said third and seventh transistors being connected in common to receive said second logical input, the gate electrodes of said fourth and eighth transistors being connected to said clock signal source to receive respectively complementary clock signals, and the junction between the conduction paths of said second and seventh transistors comprising an output of said delayed logic circuit means; and

second inverter means coupled to the output of said delayed logic circuit means, and including a complementary pair of field effect transistors for receiving and reversing the polarity of the outputs of said delayed logic circuit means to provide the output of said flip-flop circuit;

whereby when the states of first and second logical inputs are in a predetermined combination, the output state of the flip-flop circuit is held, and when the states of said first and second logical inputs are in other combinations, either one of said first and second logical inputs is dominantly derived out on the output side in response to said clock signals.

3,887,823

DIFFERENTIAL AMPLIFIER PULSE DELAY CIRCUIT

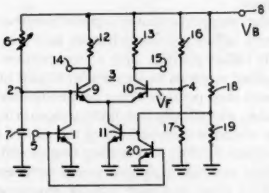
Akira Nikami, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 18, 1973, Ser. No. 425,839

Claims priority, application Japan, Jan. 19, 1973, 48-8444; Dec. 21, 1972, 47-14689; May 4, 1973, 48-50018

Int. Cl. H03k *17/26*

U.S. Cl. 307—293 **11 Claims**



1. A delay circuit comprising:

A. first and second power supply terminals;

B. a differential amplifier comprising:

1. first and second differentially connected transistors having their emitters connected together,

2. first and second input terminals connected, respectively, to the bases of said first and second transistors,

3. an output terminal,

4. means connecting said output terminal to the collector of one of said differentially connected transistors, and

5. means connecting said connected together emitters and the collectors of said differentially connected transistors to said first and second power supply terminals, respectively;

C. a time constant circuit connected to said first input terminal;

D. a first clamping circuit connected to said first input terminal to control the conductivity of said first transistor;

E. a second clamping circuit connected to said differential amplifier to control the conductivity of said second transistor;

F. pulse input means to apply pulses to be delayed to said first and second clamping circuits for activating the latter; and

G. a reference voltage circuit connected to said second input terminal, whereby said second transistor is normally conductive when said first transistor is nonconductive and said second clamping circuit is not activated.

3,887,824

COMMUNICATION MONITORING CIRCUIT

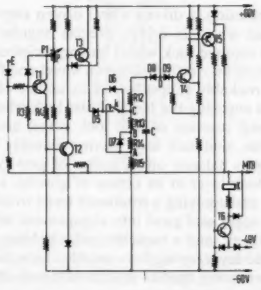
Hans Joachim Blauert; Filip Jejina, and Hans Reisch, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 5, 1973, Ser. No. 321,272

Claims priority, application Germany, Jan. 24, 1972, 2203180

Int. Cl. H03k *17/26;* **H04l** *25/02*

U.S. Cl. 307—294 **3 Claims**



1. A transmission line monitoring circuit for a telecommunication network for operating a time-dependent switching element upon the occurrence of predetermined conditions, comprising:

input circuit means for coupling the current from a transmission line in said network to said monitoring circuit including a bistable circuit connected to said transmission line and adjustable to operate at a predetermined threshold value of current on said transmission line and switching means controlled by said bistable circuit,

timing circuit means comprising parallel combination of a series connection of resistances and capacitance and a switching stage for determining the state of charge of said capacitance and

means coupling said switching element to said switching stage so as to be energized by said switching stage,

said switching element including contact means, said contact means being arranged between said switching means and said timing circuit means for controlling the charging and discharging times of said capacitance through said series connection of resistances in dependence on the operating state of said switching element by connecting said switching means during a first operating state of said contact means to a first junction point in said series connection of resistances and during a second

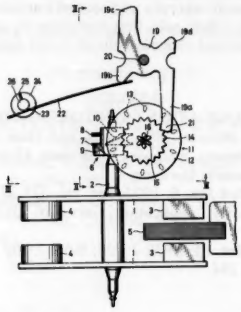
operating state of said contact means to a second junction point in said series connection of resistances.

3,887,825

CONTROL APPARATUS FOR AN INTERMITTENTLY ROTATED INDEXED WHEEL

Shoichiro Kumazawa, Kamagaya, Japan, assignor to Kabushiki Kaisha Seikosha, Japan

Filed Feb. 22, 1974, Ser. No. 444,793
Claims priority, application Japan, Mar. 6, 1973, 48-27252
Int. Cl. H02k *33/00*
U.S. Cl. 310—37 **2 Claims**



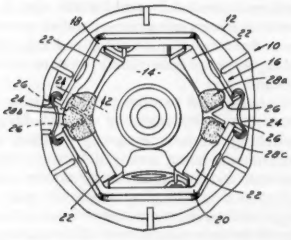
1. In combination, a driven wheel driven stepwise, means to insure said wheel is driven precise angular increments comprising a toothed lock wheel having peripheral teeth and driven synchronously with said driven wheel and fixed thereto, a lock lever rockably supported on its center of gravity and having a pawl engaging the teeth of said lock wheel to control the incremental rotation of said lock wheel and said wheel driven stepwise, said lock lever having plurality of balancing arms insuring its balance on its center of gravity means supporting said lock lever at its center of gravity, a lever spring having a free end applying a rotational force to said lock lever to resiliently apply said pawl into engagement with said teeth of the lock wheel , and a turnable collet holding another end portion of said lever spring for variably controlling the pressure said lever spring applies against said lock lever.

3,887,826

METHOD AND MEANS FOR REDUCING AUDIBLE NOISE IN A DYNAMOELECTRIC MACHINE

Theodore G. Apostoleris, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 1, 1973, Ser. No. 402,528
Int. Cl. H02k *15/12*
U.S. Cl. 310—43 **1 Claim**



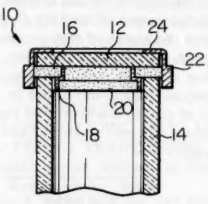
1. In combination with a permanent magnet dynamoelectric machine of the type having a stator flux producing structure comprising a plurality of permanent magnets and ferromagnetic flux path means engaging pairs of the permanent magnets, the flux path members having intersecting edge surfaces forming flux path member tips, each of the permanent magnets being located in proximity to at lease one flux path member tip, the stator flux producing structure being held in cooperative association with means forming a housing to electromagnetically coact with a rotary armature, the improvement comprising means forming a semi-rigid bonding agent interposed between the housing and the flux path member tips in contact with the associated permanent magnets to bond the flux path member to the housing.

3,887,827

TARGET ASSEMBLY OF IMAGE PICK-UP TUBE

Mitsumasa Katayama, Kadoma, Japan, assignor to Matsushita Electronics Corporation, Osaka, Japan

Continuation-in-part of Ser. No. 181,310, Sept. 17, 1971, abandoned. This application Oct. 23, 1973, Ser. No. 408,531
Claims priority, application Japan, Sept. 19, 1970, 45-93354
Int. Cl. H01j *29/02, 31/38*
U.S. Cl. 313—390 **3 Claims**



1. A target assembly of an image pick-up tube including a tubular envelope, comprising:

a transparent face plate having the diameter of said tubular envelope;

an annular, stepped metallic support member comprising an inwardly offset portion adjacent said face plate, an outwardly offset portion, and a step portion therebetween, said offset portions being parallel to said tubular envelope and said step portion being perpendicular thereto;

an annular, electrically conductive signal ring of cylindrical shape which is disposed along the rim of said face plate; an annular binding and sealing ring of soft metal which is sealingly and bindingly interposed between and welded to said face plate and said tubular envelope, has an outer diameter which is greater than the outer diameter of said tubular envelope, and has an inner diameter which is less than the inner diameter of said tubular envelope minus the radially measured width of said step portion, said binding and sealing ring being additionally welded to said inwardly offset portion along said inner diameter, whereby said binding and sealing ring has sufficient annular width to extend from said inwardly offset portion to said signal ring, said signal ring is annularly spaced from the exterior of said tubular envelope, and said outwardly offset portion is annularly spaced from the interior of said tubular envelope so that damage from mechanical shock while said image pick-up tube is in use is minimized.

3,887,828
SHADOW MASK HAVING CONDUCTIVE LAYER IN POOR THERMAL CONTACT WITH MASK

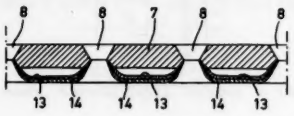
Robert Richard Bathelt, and Roelof Egbert Schuil, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 3, 1974, Ser. No. 485,370

Claims priority, application Netherlands, July 26, 1973, 7310372

Int. Cl. H01j *29/06, 29/08*

U.S. Cl. 313—402 **5 Claims**



1. A cathode ray tube for displaying coloured pictures comprising, in an evacuated envelope, means for generating a number of electron beams, a display screen comprising a large number of regions luminescing in different colours, and a colour selection electrode having a plurality of apertures, said electron beams being each assigned to luminescent regions of one colour by means of the colour selection electrode which colour selection electrode is provided with a layer for reducing the temperature of the colour selection electrode, characterized in that on the side facing the means for generating the electron beams, the colour selection electrode is provided with an electrically conductive, electron-absorbing layer whose thermal contact with the colour selection electrode is minimal said electron-absorbing layer consisting of a thin metal layer contacting and bonded to the colour selection electrode only along the edges of said apertures.

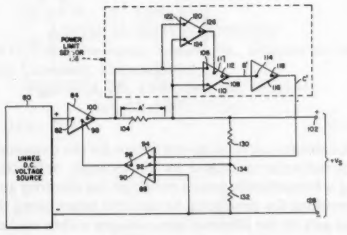
3,887,829
ELECTROMAGNETIC DEFLECTION DISPLAY SYSTEM INCLUDING DUAL MODE DEFLECTION AMPLIFIERS AND OUTPUT POWER LIMITED SUPPLIES

Abner Owens, Jr., Pompton Lakes, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed June 28, 1973, Ser. No. 374,735

Int. Cl. H01j *29/70*

U.S. Cl. 315—411 **6 Claims**



1. For use in an electromagnetic display system of the type including deflection display means and power supply means providing power for powering the deflection display means, the power supply means comprising:

a voltage source for providing an unregulated voltage;

power supply output and return terminals connected across the voltage source;

amplifier means connected intermediate the voltage source and the terminals;

means connected to the amplifier means for sampling the output therefrom;

sensor means for sensing the sampled output and for providing an output when the sensed output is commensurate with a display means deflection time in excess of a predetermined maximum deflection time; and

the amplifier means connected to the sensor means and responsive to the output therefrom for rendering the power supply in an off condition, and said power supply operating at predetermined duty cycle with the output power at a predetermined average value.

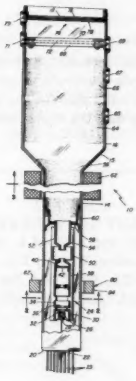
3,887,830
CATHODE RAY TUBE WITH MAGNETIC BEAM ALIGNMENT MEANS

Gordon R. Spencer, Westwood, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Sept. 7, 1973, Ser. No. 395,103

Int. Cl. H01j *29/46*

U.S. Cl. 313—443 **12 Claims**



1. An electron gun comprising:

electron beam generating means including an electron emitting cathode and an axially disposed series of electrodes, at least one of which comprises a hollow cylindrical electrode having a substantially electrostatic field-free space therein

beam limiting means including an electrode wall element disposed transversely with respect to the cylindrical electrode and having a beam restricting aperture therein; and beam aligning magnetic means including a continuous annular magnetic member coaxially disposed in the substantially electrostatic field-free space within the cylindrical electrode for providing a transverse magnetic field between selected opposing portions of the annular magnetic member and deflecting the beam into alignment with the aperture.

3,887,831
INDICATOR DISCHARGE TUBE

Tokuo Matsushita, and Satoshi Watanabe, both of Tokyo, Japan, assignors to Okaya Denki Sangyo Kabushiki Kaisha, Tokyo, Japan

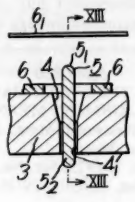
Division of Ser. No. 212,779, Dec. 27, 1971, Pat. No. 3,798,480, which is a continuation of Ser. No. 849,949, Aug. 14, 1969, abandoned. This application Feb. 7, 1974, Ser. No. 440,494

Int. Cl. H01j *1/02*

U.S. Cl. 313—516 **5 Claims**

5. An indicator discharge tube comprising an insulating base plate having a plurality of grooves of predetermined

shapes formed at predetermined locations, an anode electrode disposed opposite said insulating base plate, a plurality of cathode electrodes respectively disposed in the plurality of grooves of the insulating base plate, said anode electrode having an anode portion lying between adjacent cathode



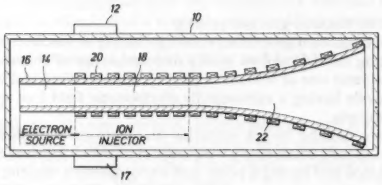
electrodes, each of said cathode electrodes having a portion jutting beyond the anode electrode in spaced relation thereto, and a tube having enclosed therein the insulating base plate, the cathode electrodes and the anode electrode in an airtight manner.

3,887,832

AUTO-RESONANT ACCELERATION OF IONS

William E. Drummond, and Millard L. Sloan, both of Austin, Tex., assignors to Aralco, Austin, Tex.

Filed June 25, 1973, Ser. No. 373,089
Int. Cl. H01j *25/10*
U.S. Cl. 315—5.41 **19 Claims**



1. A linear accelerator for accelerating injected ions, comprising

a longitudinal waveguide creating a conductive boundary,

a vacuum chamber enclosing said waveguide,

means for establishing a longitudinal static magnetic field in said waveguide,

said magnetic field being large at the entrance of said waveguide and decreasing to a small valve at the exit of said waveguide,

means for injecting ions into said waveguide,

means for establishing an intense beam of electrons immersed in said magnetic field,

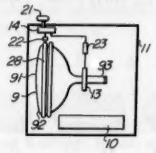
said electron beam and magnetic field sustaining a traveling wave that is the lower branch of the upper hybrid resonant cyclotron eigenmode of said beam, the phase velocity of said wave increasing in such a manner as to accelerate the injected ions trapped in said wave.

3,887,833

COLOR PURITY ADJUSTING DEVICE FOR A COLOR PICTURE TUBE

Eiichi Yamazaki, Ichihara, Japan, assignor to Hitachi, Ltd., Japan

Filed May 27, 1970, Ser. No. 40,827
Claims priority, application Japan, June 16, 1969, 44-46870
Int. Cl. H01j *29/70*
U.S. Cl. 315—13 C **7 Claims**



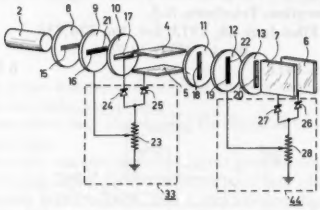
1. A color purity adjusting device for a color picture tube having a phosphor screen, comprising a first coil formed of component magnetic coils connected to form magnetic poles in the vicinity of the four corners of the phosphor screen of said color picture tube to provide a quadripole magnetic pole arrangement, each of said component magnetic coils being disposed to produce a magnetic field in a plane perpendicular to the axis of said color picture tube.

3,887,834

CATHODE-RAY TUBE HAVING AN ELECTRIC CYLINDER LENS FOR THE DYNAMIC CORRECTION OF ELECTROSTATIC DEFLECTION DEFOCUSING

Erich Eduard Himmelbauer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 31, 1969, Ser. No. 872,864
Claims priority, application Netherlands, Nov. 9, 1968, 6816003
Int. Cl. H01j *29/02, 29/56*
U.S. Cl. 315—31 R **1 Claim**



1. A cathode-ray tube having means for the dynamic correction of defocussing caused by electrostatic deflection, comprising a hermetically sealed envelope, an electron gun within said envelope for producing an electron beam along the longitudinal axis of the electron gun, a target within said envelope for receiving said electron beam, at least one pair of deflection plates on opposite sides of a plane along which said axis lies within said envelope between said electron gun and said target for electrostatically deflecting said electron beam, means for applying deflection voltage signals to said deflection plates, and an electric cylinder lens surrounding said axis within said envelope for providing corrective deflection of said electron beam to compensate for defocussing of said electron beam resulting from the electrostatic deflection of said beam by said deflection plates, said electric cylinder lens comprising two electrodes positioned substantially orthogonal to said axis, each electrode having a slot-like aperture centered relative to the axis, the longer sides of said apertures being substantially

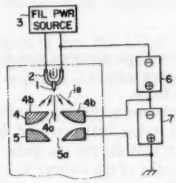
orthogonal to the direction of deflection of said electron beam, a flat grid-like electrode positioned between said electrodes substantially orthogonal to the axis, and means including two parallel rectifier elements and a grounded potentiometer, the anodes of said rectifier elements having a common connection in series with said potentiometer, the cathode of each rectifier element being connected to each deflection plate for deriving from said deflection signals a negative voltage having a value as determined by departures of the amplitude of said deflection signals from the average value thereof, and the tap of said potentiometer being connected to said grid-shaped electrode thereby to provide dynamic correction of defocussing of said beam by said deflection signals.

3,887,835

FIELD EMISSION ELECTRON GUN

Setsuo Nomura, Katsuta, Japan, assignor to Hitachi, Ltd., Japan

Filed June 11, 1973, Ser. No. 368,520
Claims priority, application Japan, June 6, 1972, 47-56910
Int. Cl. H05b *39/00*
U.S. Cl. 315—94 **5 Claims**



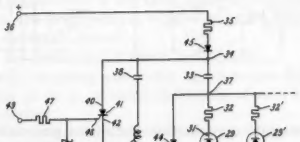
1. A field-emission electron gun comprising a cathode, a first anode, a second anode, a source of a first electric potential connected between said cathode and said first anode to form an electric field for drawing out electrons from said cathode, a source of a second electric potential connected between said first anode and said second anode to form an accelerating electric field for accelerating the electrons drawn out from said cathode, and power supply means for continuously heating said cathode to a fixed temperature within a range of from 100°C. to 500°C. during a state under which said electrons are being emitted from said cathode.

3,887,836

OPTICAL DRIVER CIRCUIT

Bernard D. Leete, Newtown Square, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Sept. 20, 1973, Ser. No. 399,254
Int. Cl. H05b *37/00*
U.S. Cl. 315—207 **9 Claims**



1. In combination:

a. a source of light comprising at least one element which when energized by an appropriate electrical input signal causes said source to issue an optical output signal;

b. a first capacitor;

c. means for coupling said capacitor in series circuit relationship with said element to a d-c power supply from which said capacitor accumulates a charge;

d. controllable switching means connected in parallel with said element and said first capacitor;

e. means responsive to a control signal for turning on said switching means, whereupon said capacitor discharges through both said switching means and said element, the capacitor discharge current serving as said input signal for said element;

f. a series combination of an inductor and a second capacitor connected in parallel with said first capacitor, said series combination introducing a ringing action in response to turnon of said switching means so as to turn off said switching means after a predetermined time delay, whereupon said d-c power supply recharges said capacitor; and

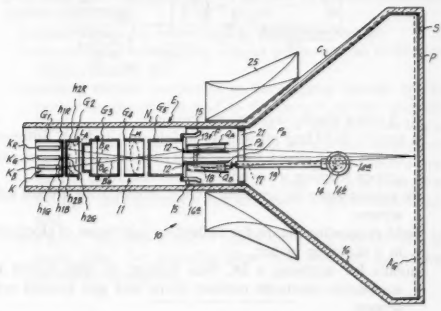
g. a diode connected across said element and poled to conduct capacitor charging current.

3,887,837

CATHODE RAY TUBE

Akira Nakayama, Tokyo; Senri Miyaoka, Fujisawa, and Akio Ohkoshi, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 23, 1973, Ser. No. 353,637
Claims priority, application Japan, Apr. 25, 1972, 47-42000
Int. Cl. H01j *29/70*
U.S. Cl. 315—368 **12 Claims**



1. In a color picture tube including an envelope having a neck portion and a conical portion extending from said neck portion to a face plate having a screen thereon, and electron gun means disposed in said neck portion for directing and focusing a plurality of electron beams at said screen and requiring first and second high voltages of different values for the operation of said gun means; means for supplying said first and second high voltages to said gun means from within said conical portion of the envelope, comprising a conductive layer on the inner surface of said conical portion and at least the adjacent part of said neck portion and having said first high voltage applied thereto, at least one first contact member extending from said gun means and engageable with said conductive layer within said neck portion for receiving said first high voltage, a lead wire extending from within said conical portion toward said neck portion and receiving said second high voltage at the end of said lead wire remote from said neck portion, a second contact member connected with the other end of said lead wire and extending into said neck portion and being engageable with said gun means for applying said second high voltage thereto, a non-magnetic, conductive tubular member extending around and being insulated from said lead wire within said conical portion, and means electrically connecting said tubular member to said conductive layer for applying said first high voltage to said tubular member and thereby avoiding disturbance to magnetic fields within said

conical portion by said second high voltage applied to said lead wire.

3,887,838

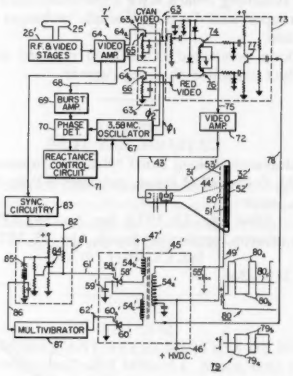
GENERATION OF STEPPED VOLTAGES FOR COLOR TELEVISION AND THE LIKE

Richard P. Thurston, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 573,907, Aug. 22, 1966, abandoned. This application Mar. 4, 1969, Ser. No. 805,113

Int. Cl. H01j *29/80*

U.S. Cl. 315—376 **2 Claims**



2. A color display system comprising:

a screen including phosphors which emit light of different colors when struck by electrons of different energies said screen forming a capacitive electrical load;

an electron gun for emitting a beam of electrons toward said screen;

field generating means for deflecting said beam of electrons in a scanning raster;

means for applying a DC bias voltage to said screen to accelerate electrons emitted from said gun toward said screen;

a transformer having a primary winding and a secondary winding, said secondary winding being adapted to be connected to said screen for applying a time-varying voltage thereto;

a first switching circuit for connecting said primary winding across a voltage source, said first switching circuit including a first electronic switching means and a capacitor in series with each other and with said primary winding, said first switching means having a gate terminal;

a second switching circuit including a second electronic switching means which is connected across said primary winding and said capacitor from a first junction between said first switching means and said primary winding to a second junction on the side of said capacitor and primary winding opposite said first switching means, said second electronic switching means having a gate terminal; and

means for applying signals to the gate terminals of said first and second switching means for triggering said first and second switching means into conduction alternately, said transformer having leakage reactance which, upon triggering of either of said first and second switching means, causes said capacitive load to be charged to a respective voltage which then reverse-biases the triggered switching means, whereby said screen is switched repetitively between at least two different voltage levels each of which persists until the next switching means is triggered and whereby said electrons are accelerated to at least two different energies for energizing said screen to produce multiple-color images.

3,887,839

PULSED FIELD EMISSION TYPE ELECTRON GUN

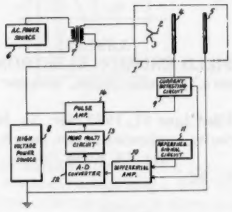
Susumu Ota, and Ryuzo Aihara, both of Tokyo, Japan, assignors to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed July 10, 1973, Ser. No. 377,932

Claims priority, application Japan, July 17, 1972, 47-71489

Int. Cl. H01j *29/52*

U.S. Cl. 315—383 **4 Claims**



1. A field emission type electron gun comprising:

a. an emitter having a tip,

b. a control electrode,

c. a power supply for supplying a pulse voltage having a constant peak value between said emitter and control electrode such that during the pulse an intense electric field in the vicinity of the emitter tip causes field emission therefrom and for supplying a bias voltage between pulses,

d. means for heating said emitter,

e. means for detecting the emitter current and

f. means responsive to the emitter current for adjusting one of the heating means and/or power supply to maintain the current substantially constant whereby the radius of curvature of the emitter tip remains substantially constant.

3,887,840

SELF-REGULATING LINE OUTPUT STAGE

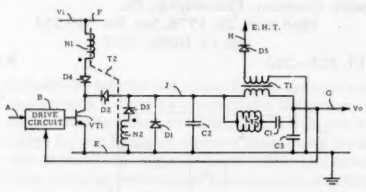
Michael John Maytum, Buckden, England, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 12, 1973, Ser. No. 415,085

Claims priority, application United Kingdom, Nov. 24, 1972, 54384/72

Int. Cl. H01j *29/70*

U.S. Cl. 315—389 **6 Claims**



1. A television combination circuit for generating a stabilized voltage for the operation of other circuits and line scan deflection signals for the deflection coils of a cathode ray tube, including a transistor, the collector of which is connected to a voltage supply through the primary winding of a transformer, and the emitter of which is connected to a reference potential, means for applying a rectangular waveform to the base of the transistor to render it alternately conducting and nonconducting, a conductor connected to the collector of the transistor through a first diode poled to pass current

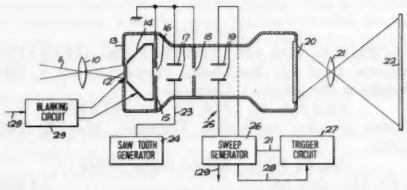
through the transistor when it is conducting, the conductor being connected separately through a resonant circuit and a second diode to the reference potential, the resonant circuit having inductive means including the deflection coils connecting the conductor to a storage capacitor connected to the reference potential and another capacitor connected from the conductor to the reference potential, and the second diode being poled so that current through it will also pass through the first diode; wherein the secondary winding of the transformer is connected in series with a third diode in a path from the reference potential to the storage capacitor to transfer to that capacitor the energy stored in the transformer while the transistor is conducting, and a fourth diode is connected between the primary winding of the first transformer and the collector electrode of the transistor to block connection of the primary and secondary windings of the transformer together through the first and third diodes.

3,887,841

HIGH SPEED CAMERA

Alexander Edward Huston, Reading, England, assignor to John Hadland Photographic Instrumentation Ltd., Herts, England

Continuation-in-part of Ser. No. 133,677, April 13, 1971, abandoned. This application June 14, 1973, Ser. No. 370,032
Claims priority, application United Kingdom, Apr. 20, 1970, 18700/70
Int. Cl. H01j *29/72*
U.S. Cl. 315—391 **2 Claims**



1. In an electron image tube camera of the type wherein an electron beam is formed in accordance with an optical image and is directed at a screen for the production of an image which is reproduced photographically and wherein the image tube includes first and second deflector means for deflecting the beam transversely in the same plane in response to electrical signals, the improvement which comprises, in combination with the deflector means:

means for generating a linear ramp signal;

means for applying said ramp signal to the first deflector means so as to produce deflection of said beam across said screen;

means for generating a repetitive signal of frequency greater than 100 MHz. and having portions capable of producing deflection of said beam at the same rate as said ramp signal; and

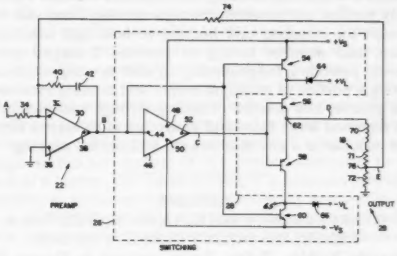
means for applying said repetitive signal to the second deflector means so that said portions produce deflection of said beam in cancellation of deflection produced by said ramp signal, and the deflection of the beam across the screen produced by the said signals alternates between substantially zero and a rapid value.

3,887,842

ELECTRONMAGNETIC DEFLECTION DISPLAY SYSTEM INCLUDING DUAL MODE DEFLECTION AMPLIFIERS AND OUTPUT POWER LIMITED POWER SUPPLIES

Abner Owens, Jr., Pompton, and Donald Weinstein, Fair Lawn, both of N.J., assignors to The Bendix Corporation, Teterboro, N.J.

Filed June 28, 1973, Ser. No. 374,730
Int. Cl. H01j *29/70, 29/76*
U.S. Cl. 315—397 **8 Claims**



1. For use with an electromagnetic deflection display system of the type including means for providing deflection signals, deflection display means and power supply means providing linear mode output power and slew mode output power for powering the deflection display means, deflection amplifier means comprising:

preamp means for receiving the deflection signals;

output means for applying output power to the deflection display means; and

switching means connected to the preamp means, to the power supply means and to the output means, and initially operative in a linear mode for applying the linear mode output power to the output means and responsive to a rate of change of the deflection signals above a predetermined rate for switching to a slew mode of operation to apply the slew mode output power to the output mean; and

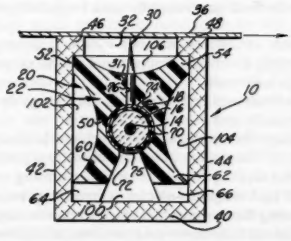
the linear and slew mode of operation being independent of each other for reducing slew time without increasing power consumption.

3,887,843

STATIC ELIMINATOR

Robert Harold Richardson, Melbourne, and Edward Richard Vokoun, Melbourne Beach, both of Fla., assignors to Harris-Intertype Corporation, Cleveland, Ohio

Filed May 10, 1974, Ser. No. 468,930
Int. Cl. H01t *19/04*
U.S. Cl. 317—2 F **12 Claims**



1. A static eliminator comprising an elongated hollow metal housing having walls defining internally facing bottom and side walls and a continuous longitudinally extending slot dis-

posed opposite said bottom wall for defining a channel opening, an elongated cable having a portion of its length located within and extending longitudinally of said housing, said cable having an inner conductive core surrounded by a dielectric layer with said core adapted to be connected to a high voltage AC source; an array of longitudinally spaced electrically conductive needles, each having a sharp projection at one end facing in a direction away from said cable; said means for mounting said cable and said needles within said housing comprising a longitudinally extending insulator member mounted within said housing, said insulator member having a body portion and mounting means extending from said body portion for engaging said housing to hold said member in place, said member having an inverted U-shaped groove therein extending longitudinally of said housing, said cable having a portion of its length within said housing received in said groove, said needles extending through said member in the direction away from said groove so as to extend beyond said member in a direction toward said slotted opening.

3,887,844

OVERCURRENT PROTECTION CIRCUIT FOR A BRUSHLESS DIRECT CURRENT MOTOR

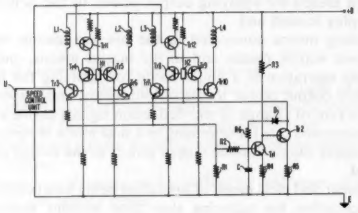
Masayuki Yoshida, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 12, 1973, Ser. No. 424,026

Claims priority, application Japan, Dec. 12, 1972, 47-142587

Int. Cl. H02h *7/085*

U.S. Cl. 317—13 R **3 Claims**



1. An overcurrent protection circuit for a brushless direct current motor including a rotor having at least one pair of magnetic poles and a stator including at least a pair of driving coils for rotating the rotor, said protection circuit comprising:

a. driving circuit means for alternately supplying current to said driving coils;

b. magneto-electric converting means for controlling said driving circuit by means of its output voltage, said output voltage varying in accordance with the variation of the magnetic field generated by said magnetic poles of said rotor;

c. a resistor connected in series with said driving coils and developing a voltage proportional to the current flowing through said coils;

d. delay circuit means for delaying the voltage developed by said resistor; and

e. switching circuit means, switched and latched when the output of said delay circuit increases to a predetermined level, for directly interrupting the operating control current of said magneto-electric converting means and for continuing the interruption even when the output of said delay circuit falls below said predetermined level, thereby turning OFF said converting means and interrupting the current flowing through said driving coils, said switching means being connected in series with the operating control current path for said magneto-electric converting means.

3,887,845

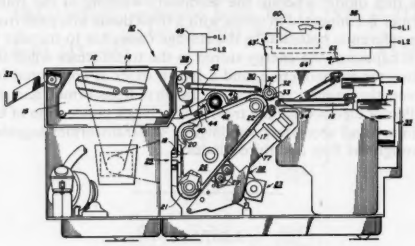
COPIER PHOTORECEPTOR CHARGE CONTROL

Robert J. Michatek, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 26, 1973, Ser. No. 400,776

Int. Cl. G03g *15/02*

U.S. Cl. 317—262 A **10 Claims**



1. The method of controlling the charge level on the photoreceptor of an electrostatic reproduction machine of the type having corona charging means for placing a charge on the photoreceptor in preparation for imaging together with means including a biased transfer roller to transfer images developed on said photoreceptor to copying material, the steps consisting of:

interrupting bias to the transfer roller while measuring the transfer roller electrical output; and

adjusting said corona charging means to provide a predetermined transfer roller output repreesenting optimum charge on said photoreceptor.

3,887,846

ELECTRODES FOR AIR CONDITIONING APPARATUS

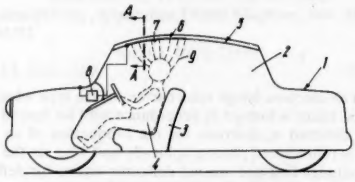
Constantin Graf von Berckheim, Friedrichstrasse 9, 6940 Weinheim (Bergstrasse), Germany

Filed Feb. 15, 1974, Ser. No. 443,012

Claims priority, application Germany, May 2, 1973, 2322022

Int. Cl. H01g ; H02b ; H02h ; H05f

U.S. Cl. 317—262 AE **6 Claims**

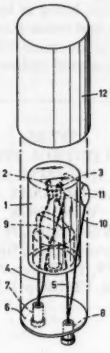


1. In a substantially enclosed habitable compartment an air conditioning apparatus comprising, in combination, first and second electrode means; a high-voltage D.C. voltage source having terminals of opposite polarity respectively connected to said first and second electrode means for establishing therebetween a steady electrostatic field in the interior of said substantially enclosed habitable compartment, at least one of said electrode means comprising a carrier of electrically insulating material, a protective cover layer of insulating material facing the interior of said substantially enclosed habitable compartment, and a layer of electrically conductive adhesive material intermediate said cover layer and said carrier holding said cover in place on said carrier by adhesive force and being electrically connected to one of said terminals to serve as the electrode for said one of said electrode means.

3,887,847
GLOW DISCHARGE STARTER SWITCH

Wilhelmus Polycarpus de Graaf; Jan Man In'T Veld, and Adrianus Petrus Vervaart, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 237,177, March 22, 1972, abandoned. This application July 11, 1973, Ser. No. 378,244
Claims priority, application Netherlands, Apr. 14, 1971, 7104999
Int. Cl. H02h *7/04*
U.S. Cl. 317—15 **6 Claims**



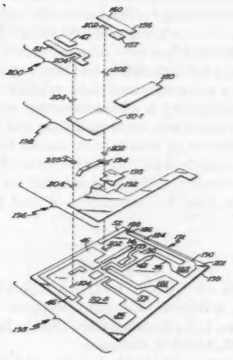
1. A glow discharge starter which comprising a discharge tube including a bimetal electrode and a second electrode cooperating therewith and a safety device being in close thermal relationship with the glow discharge-heated discharge path between the electrodes and responsive to heat generated in the discharge tube of said starter switch, said bimetal electrode being configured to bend toward said second electrode responsive to heat in said discharge tube to allow arcing between said electrodes, said safety device produces a short circuit of the power supply to said starter switch when a maximum temperature limit is reached, said safety device being outside of the discharge tube and including a first and second conductor element connected to respective electrodes of said discharge tube, said first conductor having insulative material being disposed over a portion of its length as a sleeve, said insulative sleeve adapted to undergo a permanent distortion at a predetermined maximum temperature limit, and a metallic spring element mechanically and electrically coupled to said second conductor, said spring having a portion pressing under tension against said insulative sleeve, whereby said spring element cuts through said insulative sleeve to establish electrical contact between said conductors when said predetermined maximum temperature is reached, said temperature of said insulative sleeve being raised by arcing of said electrodes.

3,887,848
APPARATUS AND MATERIAL FOR PROTECTING MICROELECTRONICS FROM HIGH POTENTIAL ELECTRICITY

Willis A. Larson, Mequon, Wis., and David E. Colglazier, Minneapolis, Minn., assignors to Magic Dot, Inc., Minneapolis, Minn.

Filed Aug. 14, 1972, Ser. No. 280,258
Int. Cl. H02h *1/04*
U.S. Cl. 317—33 R **79 Claims**

1. In a touch actuated electronic switch including microelectronic circuitry and including a touch portion, accessible to the touch of a human, coupled to an input conductor to the microelectronic circuitry, means for protecting the microelectronic circuitry from damage due to the application of high potential electricity to the touch portion, comprising in combination: a coating of electrically resistive material disposed upon the touch portion and forming an electrically unitary resistive film upon the touch portion, the resistive material including a top surface accessible to the touch of a human operator and a bottom surface secured to the touch portion, the coating presenting a distributed resistance through the resistive material from any point on the top surface to any point on the bottom surface of a value sufficient to define a current of an amount less damaging to the microelectronic circuitry associated with the touch actuated electronic switch upon the application of high potential voltage to the top surface of the coating accessible to the touch of a human, the coating further presenting a resistance between any point on the top surface accessible to the touch of a human and the input conductor to the microelectronic circuitry associated with the touch actuated electronic switch of a value sufficient to define a current of an amount less damaging to the microelectronic circuitry upon the application of a high potential voltage to the top surface of the coating accessible to the touch of a human, the material being of a hardness providing durability to withstand continual touching by humans; means for providing a connection to a reference for the microelectronic circuitry; electrical resistance means arranged between

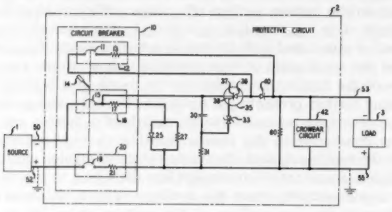


the input conductor and the remainder of the microelectronic circuitry; protective conductor means having one end thereof arranged at a distance from the input conductor to the microelectronic circuitry to define a protective spark gap between the one end and the input conductor of a breakdown voltage less than the breakdown voltage across the electrical resistance means and of a breakdown voltage less than the breakdown voltage from the input conductor to any remaining conductive portion within the microelectronic circuitry, the protective conductor electrically connected directly to the means for providing a connection to a reference for the microelectronic circuitry, the entire protective conductor means spaced from any remaining conductive portion within the microelectronic circuitry by a distance providing a breakdown voltage exceeding the breakdown voltage of the protective spark gap to provide a favored and preferred path for any high potential electricity applied to the input conductor such that the applied electricity arcs across the protective spark gap and is conducted by the protective conductor means to the means for providing a connection to a reference for the microelectronic circuitry to thus provide a conductive path for any current created by the electricity to the reference for the microelectronic circuitry without passing in any harmful way through the microelectronic circuitry.

3,887,849
PROTECTIVE CIRCUIT

Harry Henry Nagel, Westwood, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 2, 1973, Ser. No. 412,295
Int. Cl. H02h *3/18, 3/38, 11/00*
U.S. Cl. 317—36 TD **10 Claims**

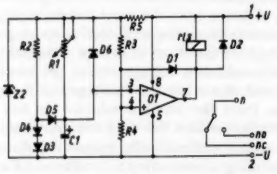


9. A protective circuit for connecting an electrical source to a load device comprising first switching means connected to said source, turnon means for rendering said first switching means conductive, turnoff means for rendering said first switching means nonconductive within a first time interval, means for detecting a predetermined condition of said source, said turnoff means being responsive to the operation of said detecting means for rendering said first switching means nonconductive within said first time interval, means responsive to said turnon means for connecting said first switching means to said load after a predetermined time greater than said first time interval comprising a semiconductive switch having a conductive state and a nonconductive state and means responsive to the operation of said turnon means for placing said semiconductive switch in its conductive state after said predetermined time, whereby said source is tested for said predetermined condition prior to connection of said source to said load.

3,887,850
DELAY CIRCUIT FOR A RELAY

Wilhelm Sterff, Schliersee, Germany, assignor to Matsushita Electric Works, Ltd., Kadoma City, Osaka, Japan and SDS-Electro GmbH, Munich, Germany

Filed Nov. 14, 1973, Ser. No. 415,651
Claims priority, application Germany, Nov. 23, 1972, 2257373
Int. Cl. H01h *47/18, 47/32*
U.S. Cl. 317—141 S **4 Claims**

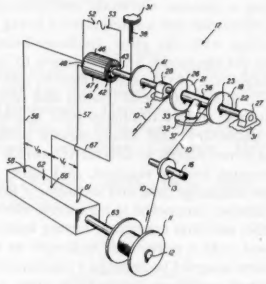


1. A circuit to delay for a predetermined time interval the response of a relay having an operating winding with one side conneted to one side of a voltage supply and comprising a differential amplifier having an output connected to the other side of the winding and non-inverting input and an inverting input, a potential divider connected across said voltage supply and having a center tap connected to said non-inverting amplifier input, a first resistor and a capacitor in series therewith both connected across said voltage supply, said amplifier inverting input connected between said first resistor and said capacitor, a diode which is blocking when the relay is not energized connected between said amplifier output and said amplifier non-inverting input, a reference voltage source comprising one of fourth and fifth diodes conducting in the direction of said voltage supply or a diode conducting in the direction of said voltage supply and a resistor in series with said diode, a second resistor in series with said reference voltage source and in parallel with said first resistor and said capacitor, said second resistor having a higher ohmic value with respect to said first resistor, a second diode conducting in the direction of the voltage supply connected to those terminals of said first resistor and said capacitor which are not connected to said voltage supply, and a third diode shunting said first resistor and blocking in the direction of said supply voltage, the reference voltage being at least twice the threshold voltage of a diode, said first resistor comprising an adjustable potentiometer having an electrical resistance of about 100-1000 times that of said second resistor.

3,887,851
TENSION SPEED CONTROL FOR A ROTATABLE STRAND SUPPLY UTILIZING A TRANSFORMER HAVING VARIABLE PRIMARY AND SECONDARY WINDINGS

Robert Phillip Loesch, Tonawanda, N.Y., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Dec. 19, 1973, Ser. No. 426,179
Int. Cl. H02p *1/56*
U.S. Cl. 318—6 **6 Claims**



1. A system for controlling the paying out of a strand from a rotatable supply thereof which comprises:

a transformer having a primary winding and a secondary winding;

a moveable contactor positionable on said transformer windings;

means for connecting said primary winding to an excitation source;

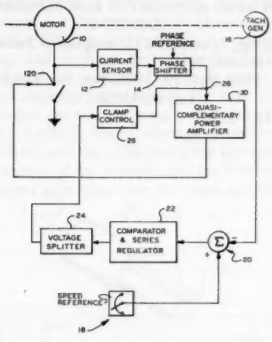
means responsible to variations in tension in said strand for moving said transformer contactor; and

driving means connected to one side of said primary winding, one side of said secondary winding and said moveable contactor for imparting a torque in a first direction to said rotatable supply when said contactor is positioned on said primary winding and for imparting a torque in a second opposite direction to said rotatable supply when said contactor is positioned on said secondary winding.

3,887,852
CONTROL SYSTEM FOR ROTATING ELECTRICAL MACHINERY USING ELECTRONICALLY DERIVED INJECTED ROTOR EMF'S

Roosevelt A. Fernandes, 5607 Bear Rd., Apt. K-12, North Syracuse, N.Y. 13212, and Harry R. Sanders, 3709 Trimble Rd., Nashville, Tenn. 37215

Continuation-in-part of Ser. No. 308,701, Nov. 22, 1972, abandoned. This application Dec. 13, 1973, Ser. No. 424,416
Int. Cl. H02p *7/36*
U.S. Cl. 318—197 **10 Claims**



1. A control system for AC machinery comprising:

a. a source of three-phase power providing a controlled reference signal;

b. means for sensing the frequency of the currents in each of the three rotor phases;

c. means for generating square wave signals of the respective frequencies and phases of each rotor phase in response to signals received from said sensing means;

d. means for generating a signal commensurate with actual rotational speed of the machine;

e. means for selectively varying said reference signal;

f. means for comparing said signal commensurate with actual rotational speed and said varied reference signal and providing an amplified difference signal output;

g. means for dividing said signal output into equal positive and negative signal levels;

h. means for clamping said signal levels at predetermined amplitude levels; and

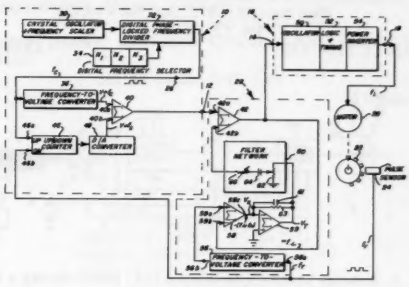
i. means for applying said clamped signal levels to the respective rotor windings at the required current level.

3,887,853
STABILIZING SYSTEM FOR AN INVERTER-DRIVEN INDUCTION MOTOR

Frank N. Klein, and Gerald F. O'Callaghan, both of Kenosha, Wis., assignors to Eaton Corp., Cleveland, Ohio

Filed Dec. 14, 1973, Ser. No. 424,725
Int. Cl. A02p *7/42*
U.S. Cl. 318—230 **15 Claims**

1. Stabilizing apparatus for use with an inverter-driven induction motor system having an inverter responsive to a principal control signal to produce ac excitation for the stator of the motor comprising sensor means for sensing the speed of the rotor of the motor and for producing a first signal dependent thereon, circuit means for producing a second signal in accordance with the frequency of power with which the stator of said motor is excited by said inverter, algebraic combining means for combining said first and second signals to produce a third signal representative of the slip frequency of said motor, frequency-dependent filter means receiving said third signal for producing a filtered fourth signal in response to said third signal at least at times when said third signal is substantially below a pull-out level, and means for controlling said

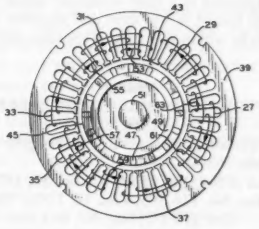


inverter in accordance with both said fourth signal and said principal control signal.

3,887,854
MULTI-SPEED MOTOR

Walter K. Parks, Springfield, Mo., assignor to General Electric Company, Fort Wayne, Ind.

Filed Dec. 3, 1973, Ser. No. 420,981
Int. Cl. H02k *17/08*
U.S. Cl. 318—224 A **10 Claims**



1. An electric motor for operation selectively at at least two different speeds, a magnetic core having a plurality of winding accepting slots;

first winding means disposed in at least some of the core slots;

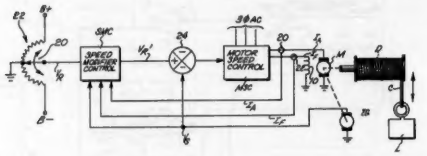
means for selectively connecting the main winding means, in one of at least two different pole number configurations to a source of excitation voltage to thereby provide for more than one operating speed;

auxiliary winding means disposed in at least some of the core slots and energizable in conjunction with the main winding means to provide a starting torque for the motor regardless of the particular pole number configuration of the main winding means, the auxiliary winding means comprising a number of coil groups defining the same number of salient polar axes, the auxiliary winding means being arranged on the core so that a first half of the coil groups are uniformly distributed on the core and a second half of the coil groups are uniformly distributed on the core, with at least two mechanically adjacent ones of the coil groups establishing instantaneous poles of opposite polarity and being separated by an arcuate distance greater than the separation between other salient polar axes of the auxiliary winding means.

3,887,855
MOTOR SPEED MODIFIER CONTROL

Robert G. Klimo, Parma, Ohio, assignor to Cleveland Machine Controls, Inc., Cleveland, Ohio

Filed Nov. 28, 1973, Ser. No. 419,718
Int. Cl. H07p 5/16
U.S. Cl. 318—332 13 Claims



1. A motor control system for a D.C. motor having a field and armature and exhibiting available torque over a motor speed range within a desired speed-torque relationship and comprising:

means for providing a motor speed signal representative of actual motor speed,

means for providing a speed reference signal representative of a desired motor speed,

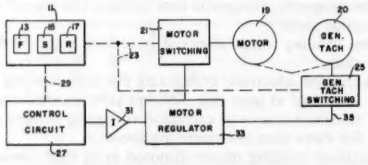
motor speed control means for controlling energization of said motor to operate at a motor speed dependent upon a given relationship of said motor speed signal and said reference speed signal, and

speed modifier control means including means for providing a torque signal representative of the available motor torque, and means for effectively varying said reference speed signal to reduce said motor speed only when said motor operates in a field weakened speed range and the available torque is less than that required for the motor speed to be within said desired speed-torque relationship.

3,887,856
PUSH-BUTTON-OPERATED MOTOR SPEED CONTROL CIRCUIT

Frank N. Cicchiello, Norristown, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 256,670, May 25, 1972, which is a division of Ser. No. 116,395, Feb. 18, 1971. This application Oct. 2, 1973, Ser. No. 402,706
Int. Cl. H02p 5/12
U.S. Cl. 318—345 9 Claims



1. A motor speed control system for controlling current flow to a motor comprising:

current-control means including two current-carrying electrodes, and a control electrode having substantially complete current flow isolation with respect to said current-carrying electrodes, said current-control means being coupleable to the motor for controlling current flow to the motor as the function of a voltage level upon said control electrode;

means coupleable to the motor for providing a settable minimum current flow level to the motor;

a capacitor connected to said control electrode for controlling the voltage level on said control electrode in proportion to the charge on said capacitor;

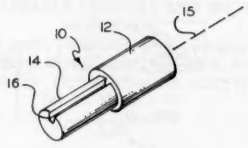
first manually operable means having a controllable duration of actuation for charging said capacitor, the charging of said capacitor being directly proportional to the duration of actuation of said first manually operable means; and

second manually operable means having a controllable duration of actuation for discharging said capacitor, the discharging of said capacitor being directly proportional to the duration of actuation of said second manually operable means.

3,887,857
MEASURING APPARATUS FOR MACHINE TOOL SYSTEMS

Joseph Elbling, Armonk, N.Y., assignor to Inductosyn Corporation, Valhalla, N.Y.

Filed Nov. 19, 1973, Ser. No. 416,892
Int. Cl. G05b 19/24
U.S. Cl. 318—572 7 Claims



1. In the method of providing a signal representation of an unknown dimension of a portion of a workpiece unsuited for direct gage measurement mounted within a machine tool, the steps of:

generating dimension signals representative of a gaged dimension of said workpiece in response to a signal provided by a gage which senses said gaged dimension;

generating machine slide signals which change in response to a movement of a machine slide of said machine tool;

altering said machine slide signals to conform to said dimension signals when said machine slide is connected to a portion of said workpiece having said gaged dimension; and

positioning said machine slide for connection with said portion of said workpiece having said unknown dimension.

3,887,858
BATTERY CHARGING

Wilford B. Burkett, Pacific Palisades, and George D. Carlsen, II, Venice, both of Calif., assignors to McCulloch Corporation, Los Angeles, Calif.

Continuation of Ser. No. 240,137, March 31, 1972, abandoned. This application June 14, 1973, Ser. No. 370,007
Int. Cl. H02j 7/04
U.S. Cl. 320—31 6 Claims

1. A method of charging a lead acid battery comprising the steps of applying a charging current for a first interval of time at a rate sufficient to cause gassing as charge progresses and to reach the hard gassing point for the battery; monitoring the battery terminal voltage; and upon attaining the battery terminal voltage corresponding to the hard gassing point of the battery contuining the application of charging current for a second interval of time having a duration dependent upon the duration of the first interval of time at a rate sufficient to maintain the battery terminal voltage above the decomposition potential of the electrolyte.

5. A circuit for charging a battery comprising

a constant current source,

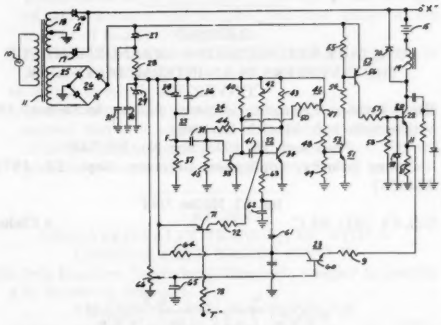
circuit means for connecting the source to a battery to be charged,

circuit means for monitoring the terminal voltage of the battery under charge during a first interval of charge,

means responsive to the attainment of a preselected terminal voltage for starting a second interval of charge,

means for determining the duration of the first interval and for limiting the duration of the second interval to a preselected percentage of the duration of the first interval,

the monitoring means comprises a voltage divider network connected across the battery, the network comprising at least one Zener diode in series with a potentiometer; the responsive means comprises a first silicon controlled rectifier having its gate connected to the movable arm of the potentiometer, its cathode connected to the negative terminal of the battery and its anode connected to the positive terminal of the battery through a current limiting resistor, and a NPN transistor switch for connecting the determining and limiting means to the battery under charge during the first interval, the base of the transistor being connected to the anode of the first silicon controlled rectifier, the emitter being connected to the determining and limiting means through a second current limiting resistor and the collector being connected to the positive terminal of the battery; and the determining and limiting means comprises one or more electrochemical



cells charged during the first interval through the NPN transistor and discharged during the second interval through a diode and the base-emitter junction of a second NPN transistor switch, the base of the second transistor being connected to the positive terminal of the cell through a diode, the emitter of the second transistor being connected to the negative terminal of the cell and the battery under charge in common, a second silicon controlled rectifier controlled by the conduction state of the second transistor and the conduction state of a PNP transistor switch, the base of the PNP transistor being connected to the anode of the first silicon controlled rectifier, the collector of the PNP transistor being connected through a current limiting resistor to the gate of the second silicon controlled rectifier, the emitter of the PNP transistor being connected to the positive terminal of the battery under charge, the anode of the second silicon controlled rectifier being connected to the positive terminal of the battery through a current limiting resistor, the cathode of the second silicon controlled rectifier being connected to the negative terminal of the battery, and circuit means connected between the anode of the second silicon controlled rectifier and the source for reducing the current to a trickle charge upon the firing of the second silicon controlled rectifier.

3,887,859

SELF-COMMUTATING FREQUENCY CONVERTER WITH ADDITIONAL CHARGING ARRANGEMENT

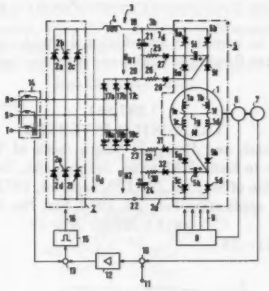
Klaus Hubner, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 25, 1974, Ser. No. 464,329

Claims priority, application Germany, Apr. 26, 1973, 2321199

Int. Cl. H02m *7/48, 5/44*

U.S. Cl. 321—5 **4 Claims**



1. In a static frequency changer comprising a line commutated controlled converter configured as a rectifier bridge, a d-c link circuit and a self-commutating converter, in which self-commutating converter all controlled rectifier valves which are tied to the same bus of the d-c link circuit are connected with each other through commutation capacitors, wherein the improvement comprises:

a. a first set of supplementary uncontrolled rectifiers coupled to at least one half of the bridge of the line commutated converter so as to form a first semicontrolled rectifier bridge having as one terminal one bus of the d-c link circuit and as another terminal, the output of said uncontrolled rectifiers;

b. a smoothing capacitor shunted across said one and another terminals;

c. first series circuits each comprising a resistor and a decoupling diode coupling said another terminal to one side of each said commutation capacitor associated with controlled rectifiers in the self-commutating converter which are coupled to the bus of said d-c link forming said one terminal; and

d. second series circuits each comprising a resistor and a decoupling diode coupling said another terminal to the other side of each of said commutation capacitors.

3,887,860

FUSELESS INVERTER

Thomas Joseph Bernhardt, Racine, and Frank N. Klein, Kenosha, both of Wis., assignors to Eaton Corp., Cleveland, Ohio

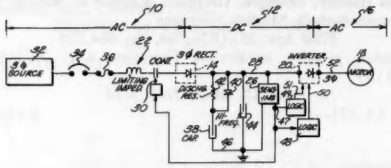
Filed Jan. 15, 1972, Ser. No. 306,521

Int. Cl. H02h *7/10*

U.S. Cl. 321—14 **27 Claims**

1. An electrical system for receiving power from a DC electrical source comprising a static inverter means including a plurality of main semiconductor means for inverting the power and auxiliary semiconductor means for commutating off said main semiconductor means upon conduction of said auxiliary semiconductor means, sensing means for detecting an abnormality indicative of a current overload fault and producing a signal thereupon, and control means responsive

to said signal for initiating current conduction upon occurrence of the fault in at least one of said auxiliary semiconductor means to complete an additional shunt current path to share current flowing to said static inverter means.



3,887,861

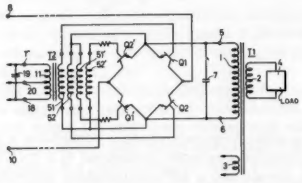
TRANSISTOR INVERTER

Hiroshi Anzai, and Hiroyuki Miura, both of Tokyo, Japan, assignors to Kabushikikaisha Tokyo Keiki, Tokyo, Japan

Continuation of Ser. No. 289,170, Sept. 14, 1972, abandoned. This application Feb. 22, 1974, Ser. No. 444,842

Int. Cl. H02m *7/52*

U.S. Cl. 321—18 **3 Claims**



1. A transistor inverter comprising:

a DC power source;

an output transformer having primary, secondary and tertiary windings;

a load connected to the secondary winding of the output transformer;

a first transistor having its collector connected to one end of the DC power source and its emitter connected to one end of the primary winding of the output transformer;

a second transistor having its collector connected to the one end of the DC power source and its emitter connected to the other end of the primary winding of the output transformer;

a third transistor having its collector connected to the other end of the DC power source and its emitter connected to the other end of the primary winding of the output transformer;

a fourth transistor having its collector connected to the other end of the DC power source and its emitter connected to the one end of the primary winding of the output transformer;

a drive control signal generator generating rectangular drive control signals of opposite polarities;

a control signal generator having a rectifier for rectifying an output derived from the tertiary winding of the output transformer, a constant voltage circuit for generating a constant voltage and a comparator for generating a control signal by comparing an output derived from the rectifier with the constant voltage derived from the constant voltage circuit;

a driving signal generator having a driving transformer with primary, secondary, tertiary, quarternary and quinary windings, a fifth transistor having its collector connected to the one end of the primary winding of the driving transformer and its emitter connected to the other end of the DC power source, a sixth transistor having its collector connected to the other end of the primary winding of the driving transformer and its emitter connected to the other end of the DC power source, a seventh transistor having its collector connected to the neutral point of the primary winding of the driving transformer and its emitter connected to the one end of the DC power source and a waveform adjusting capacitor connected between both ends of the primary winding of the driving transformer, the one and other ends of the secondary winding of the driving transformer being connected to the base of the first transistor and the emitters of the second and third transistors, respectively, the one and other ends of the tertiary winding of the driving transformer being connected to the emitters of the first and fourth transistors and the base of the second transistor, respectively, the one and other ends of the quarternary winding of the driving transformer being connected to the emitters of the first and fourth transistors and the base of the third transistor, respectively, and the one and other ends of the quinary winding of the driving transformer being connected to the base of the fourth transistor and the emitters of the second and third transistors, respectively;

means for supplying the rectangular drive control signals derived from the drive control signal generator to the bases of the fifth and sixth transistors of the driving signal generator, respectively; and

means for supplying the control signal derived from the comparator of the control signal generator to the base of the seventh transistor of the driving signal generator.

3,887,862

AUXILIARY EXTINGUISHING ARRANGEMENT FOR THE INVERTERS IN AN INTERMEDIATE LINK CONVERTER

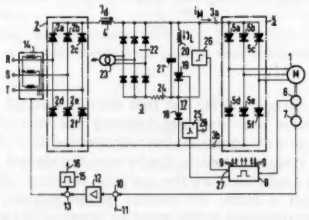
Klaus Hubner, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 20, 1973, Ser. No. 399,348

Claims priority, application Germany, Sept. 22, 1972, 2246562

Int. Cl. H02m *5/44*

U.S. Cl. 321—45 C **4 Claims**



1. An auxiliary extinguishing arrangement for the rectifier devices of an intermediate link converter supplying an electric motor, said intermediate link converter including a logic circuit for controlling the firing of the rectifier devices, where the improvement comprises:

a. a series circuit including a reversing choke, a controlled rectifier and an un-controlled rectifier, placed across the output of the intermediate link;

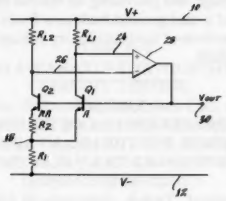
b. a commutation capacitor shunted across the series combination of the reversing choke and controlled rectifier;

c. means for voltage detection having its input coupled to measure the voltage at said commutation capacitor and providing its output as a disabling input to the logic circuit, said voltage detection means providing a disabling output during each commutation when the voltage at said commutation capacitor falls below a predetermined limit.

3,887,863
SOLID-STATE REGULATED VOLTAGE SUPPLY

Adrian Paul Brokaw, Burlington, Mass., assignor to Analog Devices, Incorporated, Norwood, Mass.

Filed Nov. 28, 1973, Ser. No. 419,616
Int. Cl. G05f *1/48*
U.S. Cl. 323—19 **19 Claims**



17. A solid-state temperature-compensated voltage supply comprising:

first and second transistors arranged to conduct respective currents;

voltage means to provide base voltage to said transistor bases to produce current densities therein having a non-unity ratio;

circuit means including resistance means connected to the emitters of said two transistors to develop a first voltage proportional to the difference in base-to-emitter voltages of said transistors and to apply said first voltage to the emitter of said second transistor;

means coupling the bases of said two transistors together to provide for tracking of the base potentials;

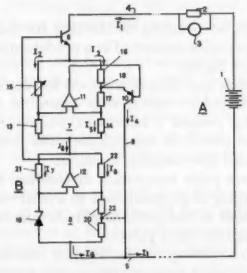
an output terminal; and

means coupling said output terminal to the base of said second transistor to provide at said output terminal an output voltage proportional to said first voltage combined with the base-to-emitter voltage of said second transistor.

3,887,864
MEASURED-VALUE TRANSDUCER WITH A COMPENSATING BRIDGE CIRCUIT

Ole Friis Knudsen, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Nov. 14, 1973, Ser. No. 415,568
Claims priority, application Germany, Nov. 16, 1972, 2256196
Int. Cl. G05f *1/58*
U.S. Cl. 323—40 **13 Claims**

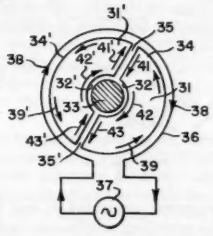


1. A measuring-transducer circuit arrangement suitable for a two-line telemetering system, the circuit arrangement comprising: a first bridge circuit including a compensating resistor and having two bridge diagonals; a current regulator; a comparator circuit comprising a Zener diode forming a reference element for establishing a constant reference voltage and a reference-voltage resistor for developing a voltage used for controlling said current regulator; and a measuring amplifier connected to one of said bridge diagonals, said measuring amplifier controlling a compensating current which in use flows in said compensating resistor; said current regulator and said Zener diode being connected in a series path which also includes the other of said bridge diagonals said series path having two ends respectively for connection to said two lines of said telemetering system.

3,887,865
EDDY CURRENT TESTING APPARATUS USING SEGMENTED MONOTURN CONDUCTIVE MEMBERS

Robert A. Brooks, Rye, N.Y., assignor to Magnetic Analysis Corporation, Mount Vernon, N.Y.

Filed Feb. 15, 1974, Ser. No. 442,847
Int. Cl. G01r *33/12*
U.S. Cl. 324—40 **7 Claims**



1. Eddy current testing apparatus for the non-destructive testing of objects which comprises

a. a body section having an opening therethrough,

b. a coil supported by said body section and encircling said opening,

c. a segmented monoturn conductive member for said opening formed of a plurality of separate segments which when assembled in the opening provide a segmented inner aperture for an object to be tested and a segmented surface encircling the aperture and spaced therefrom,

d. said segments when in assembled relationship being insulated from each other,

e. mounting means for securing said segments in said opening with said coil encircling said segmented encircling surface of the assembled monoturn member,

f. means for supplying alternating or pulsed current to said coil for inducing current flow in said segmented encircling surface,

g. said assembled monoturn conductive member being designed and adapted for producing current flow around the surface segments of said aperture in like direction opposite to the direction of current flow in said encircling surface in response to said current in said coil and thereby produce a magnetic field to induce eddy currents in an object located in the aperture,

h. and detecting and indicating means responsive to variations in said eddy currents for indicating variations in said object.

3,887,866
SURGE TESTER FOR TESTING AN ELECTRICAL WINDING AND INCLUDING VOLTAGE COMPARISON MEANS

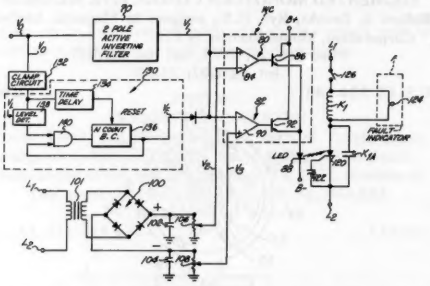
Michael B. Safer, Shaker Heights, and Andrew J. Menegos, Copley, both of Ohio, assignors to Avtron Manufacturing, Inc., Cleveland, Ohio

Division of Ser. No. 368,306, June 8, 1973. This application Sept. 20, 1974, Ser. No. 567,675
Int. Cl. G01r *31/02, 31/06*
U.S. Cl. 324—51 **6 Claims**

1. A surge tester for testing an electrical winding comprising:

means for respectively applying first and second surge voltage pulses to a test winding and a standard winding,

surge voltage generating means for developing said surge voltage pulses from an AC voltage source such that the magnitude of a said voltage pulse is proportional to the magnitude of said AC voltage source, said AC voltage source being an AC line voltage source and said surge voltage generating means including means for developing said surge voltage pulses from said AC line voltage source so that the magnitude of a said surge voltage pulse is proportional to the peak value of said AC line voltage source;



output circuit means connected to said test and standard windings for providing a difference voltage exhibiting a magnitude representative of any difference in the voltages developed across said windings in response to application of the first and second surge voltage pulses thereto;

fault detector means including means for comparing any said difference voltage with a reference voltage and providing an output signal in dependence upon said comparison; and,

circuit means for providing a said reference voltage derived from a said AC voltage source with said reference voltage having a magnitude which varies in proportion to variations in the magnitude of said AC voltage source.

3,887,867

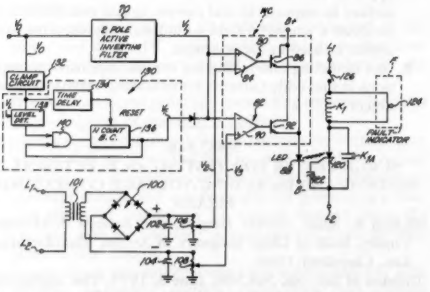
SURGE TESTER FOR DETECTING A GROUND FAULT IN AN ELECTRICAL WINDING

Michael B. Safer, Shaker Heights, and Andrew J. Menegos, Copley, both of Ohio, assignors to Avtron Manufacturing, Inc., Cleveland, Ohio

Division of Ser. No. 368,306, June 8, 1973. This application Sept. 20, 1974, Ser. No. 507,784

Int. Cl. G01r *31/02, 31/06*

U.S. Cl. 324—51 **3 Claims**



1. Apparatus for surge testing a winding to determine the presence of a ground fault by virtue of an electrical connection, at least when a surge voltage pulse is applied to said winding, between said winding and an associated electrically conductive core member comprising:

capacitor means connected between said winding and said core member;

means for applying a surge voltage pulse to said winding so that if a said ground fault exists, a damped oscillatory output voltage is provided across said capacitor means; and

ground fault detector means for receiving a said oscillatory output voltage and providing an output indication representative of a said ground fault as a function of the number of pulsations of said oscillatory voltage during a given period of time.

3,887,868

MEASURING DEVICE FOR DETERMINING THE CONCENTRATION AND THE MEAN PARTICLE SIZE OF PARTICLES SUSPENDED IN AN ELECTROLYTICALLY CONDUCTIVE LIQUID

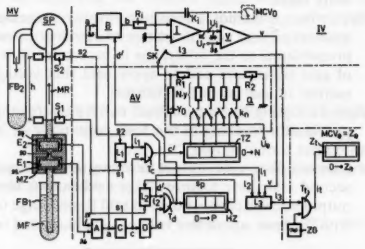
Walter Guggenbuhl, Zurich, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Filed Sept. 4, 1973, Ser. No. 394,125

Claims priority, application Switzerland, Sept. 14, 1972, 13434/72

Int. Cl. G01n *27/00*

U.S. Cl. 324—71 CP **1 Claim**



1. An apparatus for measuring the mean volume of a multiplicity of particles contained in an electrolytically conductive suspension liquid, comprising, in combination:

a. means defining a capillary restricted measurement path arranged between two electrodes;

b. a particle detector device incorporating means for propelling the suspension liquid through the capillary restricted measurement path;

c. pulse generator means for generating for each particle which passes through the measurement path a particle pulse with a peak amplitude proportional to the particle volume;

d. a particle pulse counting mechanism for indicating the sum of the particles contained in a predetermined volume of suspension liquid;

e. pulse counting and selection means for converting only such particle pulses which, with regard to a preceding particle pulse possess a minimum spacing in time, into square wave pulses of appropriate peak amplitude and predetermined non-variable duration;

f. a square wave pulse integration mechanism for the integrating charging of a capacitance to a final voltage which is proportional to the peak amplitude summation of all integrated square wave pulses;

g. an auxiliary counting mechanism for counting all integrated square wave pulses until reaching a predetermined final numerical value;

h. means for the automatic placing into standstill the integration operation of the integration mechanism upon reaching a predetermined final counter state of the auxiliary counter mechanism and for connecting the capacitance to a discharge current circuit upon termination of the counting function of the particle pulse counting mechanism;

i. means for the automatic parallel circuit connection of additional conductance values at a basic conductance value of a discharge current circuit in functional dependency of the attained counter state of the particle pulse counter mechanism; and

j. means for measuring the discharge time of the capacitance as an actual time value which is proportional to the mean particle volume.

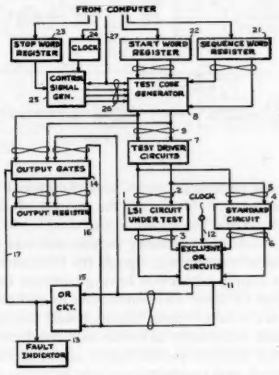
3,887,869
METHOD AND APPARATUS FOR HIGH SPEED DIGITAL CIRCUIT TESTING

John B. Connolly, Nabnasset, and Yohan Cho, Carlisle, both of Mass., assignors to Tau-tron, Inc., North Billerica, Mass.

Continuation of Ser. No. 21,657, March 27, 1970, abandoned. This application July 25, 1972, Ser. No. 275,021

Int. Cl. G01r *15/12*

U.S. Cl. 324—73 R **4 Claims**



1. A system for testing a complex electronic circuit where the same set of input signals are simultaneously applied to a test circuit and a standard circuit and output signals from the test and standard circuits are simultaneously compared to detect a fault in the test circuit comprising,

a random number generator for generating random parallel binary numbers of up to N bits each at a rate in the dynamic operating range of the test circuit, each random number being represented as a set of N generator output signals,

means applying said N output signals to inputs of both the test and standard circuits which produces in response thereto, test and standard sets of M output signals,

a set of M coincidence comparing circuits, each responsive to corresponding output signals from the test and standard circuits, said M comparing circuits producing a set of M fault signals,

an N stage register for storing a random number,

an M stage register for storing M fault output signals,

means responsive to the M fault output signals for feeding the particular random number applied to the test and standard circuits, which results in at least one fault output signal from the comparing circuits, to the N stage register, and

means responsive to the M fault output signals for feeding the fault output signals to the M stage register at the same time the said particular random number is fed to the N stage register,

whereby said registers store information indicative of inputs and outputs of the test circuit when a fault occurs.

3,887,870
PULSE REPETITION RATE METERS

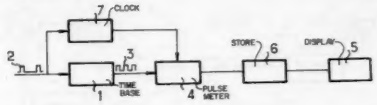
Albert Grosseau, Chaville, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed Sept. 28, 1972, Ser. No. 293,023

Claims priority, application France, Sept. 30, 1971, 71.35897

Int. Cl. G01h *23/02*

U.S. Cl. 324—78 D **7 Claims**



1. A pulse-repetition rate meter, comprising

time base means having an input to receive pulses whose repetition rate is to be measured and an output, the time base means being operative upon receipt of each pulse at its input to generate a predetermined plurality of auxiliary pulses at a frequency such that the said plurality is completed before the next following pulse to be measured occurs,

counting means having an input connected to the output of the time base means and a gate input, and

control means for supplying a control signal to the gate input of the counting means to render the counting means operative to count said auxiliary pulses for a predetermined duration only, whereby the count registered by the counting means is representative of the repetition rate of the pulses applied to the input of the time base means.

3,887,871
VARIABLE QUANTITY MEASURING DEVICES

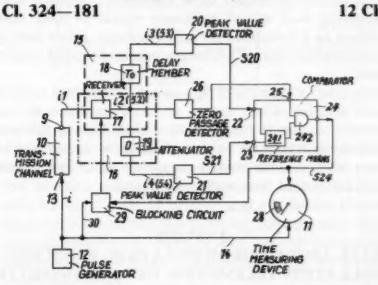
Burckhard Aechter, Achim, and Manfred Gerlach, Bremen-Mahndorf, both of Germany, assignors to Fried Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Oct. 31, 1973, Ser. No. 411,319

Claims priority, application Germany, Nov. 4, 1972, 2254019

Int. Cl. G04f *9/00*

U.S. Cl. 324—181 **12 Claims**

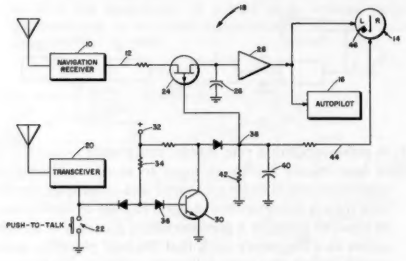


3. Circuit arrangement as defined in claim 1 wherein said measuring means comprises: a measurement receiver; shifting means connected to said receiver for shifting the output therefrom relative to the independent variable by an amount equal to the selected number of oscillation periods; attenuation means connected to said receiver for attenuating the dependent variable values of the receiver output by an amount related to the given ratio; and peak value detector means connected between the outputs of said shifting means and said attenuating means and inputs of said comparator means for causing such comparison signal to be emitted at the output of said comparator means when the values of the signals from said detector means indicate that the given ratio is present between the dependent variable values of such a pair of peaks.

3,887,872
FREEZE CIRCUIT FOR AIRCRAFT RADIO NAVIGATION SYSTEMS

Claude A. Sharpe, Ft. Lauderdale, Fla., assignor to The Bendix Corporation, Southfield, Del.

Filed Dec. 5, 1973, Ser. No. 421,881
Int. Cl. H04b *1/40, 1/44*
U.S. Cl. 325—21 **4 Claims**



1. In a radio navigation system, means for eliminating adverse effects of false guidance signals caused by intermittent transmissions from a nearby communications transmitter, said navigation system including a receiver tuned to a frequency within a band of frequencies assigned for navigation use and providing guidance signal output, and means utilizing said guidance signal output, said communications transmitter operating in a communications band of frequencies adjacent said navigation band of frequencies and being active to transmit or inactive depending upon the operation of a first switch means; comprising,

second switch means interposed between said navigation receiver and said utilizing means, a first condition of said second switch means permitting application of guidance signal from said receiver to said utilizing means, a second condition of said second switch means interrupting application of said guidance signal to said utilizing means;

means for storing said guidance signal during the time said second switch means is in said first condition and for applying said stored guidance signal to said utilizing means as a substitute for said guidance signal during the time said second switch means is in said second condition; and

means controlled by said first switch means and controlling said second switch means to cause said second switch means to change from said first condition to said second condition whenever said transmitter is active and to revert said second switch means to said first condition whenever said transmitter is inactive.

3,887,873
PULSE AMPLITUDE MODULATION, FREQUENCY MODULATION TELEMETRIC DATA TRANSMITTER

Jerry E. Duncan, and Lance E. Riggin, both of Indianapolis, Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

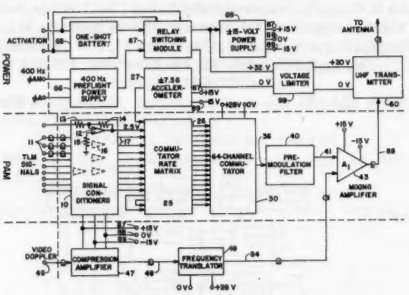
Filed July 8, 1971, Ser. No. 163,531
Int. Cl. H04b *1/04*
U.S. Cl. 325—113 **8 Claims**

1. A pulse amplitude modulation, frequency modulation telemetric data transmission system comprising:

a pulse amplitude modulation telemetry signal subsection having signal conditioners to receive channeled telemetry signals and unify the amplitudes thereof, a commutation rate matrix coupled to said signal conditioners to receive said uniform signals and matrix them to appear on an appropriate number of channel outputs, a channel commutator of gates driven in sequence by a counter circuit that is driven by a clock pulse source with each gate coupled to a channel output of said matrix through said gate to a common output, and a premodulation filter coupled in said common output;

a video doppler subsection having a compression amplifier to receive video doppler frequency signals of random amplitude to compress said signals to a uniform amplitude on an output thereof, and a frequency translator coupled to the compression amplifier output to translate said frequency signals to corresponding levels different from the frequency levels of said telemetry signals on an output thereof;

a transmitter for transmitting radio frequency signals;



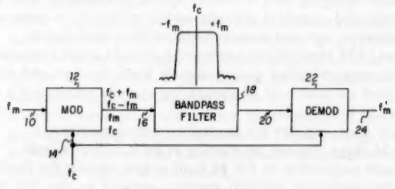
a summing amplifier coupled to said common output of said premodulation filter and the output of said frequency translator and having an output coupled to said transmitter to sum said telemetry signals and said video doppler signals into composite signals for transmission; and

a power supply subsection having batteries therein coupled through switches and conductors to said telemetry channel, said video doppler channel, said summing amplifier, and said transmitter to switch said conductors to external taps for external power supply under one condition and to switch said conductors to said batteries under another condition whereby telemetry signals of missile operation and video signals of a target object with respect to said missile are transmitted over a single radio channel.

3,887,874
LOW PASS FILTER APPARATUS

Thomas D. Reed, Plano, and Wayne A. Winget, Richardson, both of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 10, 1974, Ser. No. 468,777
Int. Cl.[2] H03B *1/04*
U.S. Cl. 328—167 **1 Claim**



1. A lowpass filter apparatus comprising, in combination:

input means for supplying a signal to be lowpass filtered;

apparatus output means for supplying lowpass frequency filtered signals;

bandpass transversal filter means having a frequency bandwidth of approximately twice the range of the range of frequencies to be lowpass filtered the phase shift through

said filter means being substantially constant throughout the lowpass frequency design range; and

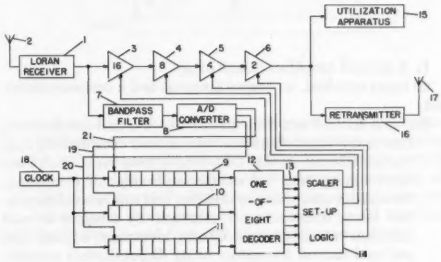
double balanced modulator-demodulator means directly connecting said bandpass filter between said input means and said output means, said modulator means increasing the average frequency of signals to be filtered before being applied to said filter means and said demodulator means decreasing the average frequency before applying the signal received from the filter means to said apparatus output means.

3,887,875

DIGITAL SIGNAL LEVELING DEVICE

Harry D. Shearer, St. Petersburg, and Eli J. Dalabakis, Seminole, both of Fla., assignors to NCR Corporation, Dayton, Ohio

Filed Sept. 7, 1973, Ser. No. 395,022
Int. Cl. H03b *3/02*; **H03k** *5/02*
U.S. Cl. 328—168 **7 Claims**



1. Automatic gain control apparatus for leveling the amplitude of pulses received at a predetermined repetition rate, said automatic gain control apparatus having an input terminal and an output terminal, said automatic gain control apparatus comprising:

A. an analog-to-digital converter coupled to said input terminal for converting the amplitude of pulses appearing thereat into a plural bit digital representation, each of said bits issuing from separate outputs from said analog-to-digital converter:

B. a plurality of pulse delay means corresponding in number to the number of bits in said plural bit representation;

C. means coupling each output from said analog-to-digital converter to the input of a separate one of said plurality of pulse delay means;

D. scaler means connected between the input and output terminals of said automatic gain control apparatus for selectively attenuating a pulse passing therethrough in accordance with level control signals applied to said scaler; and

E. means for receiving the digital representation from said delay means and developing level control signals in accordance with the bit configuration of the plurality of pulse delay means for application to said scaler.

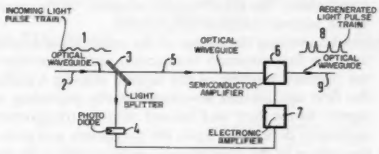
3,887,876

OPTICAL INTERMEDIATE AMPLIFIER FOR A COMMUNICATION SYSTEM

Gunter Zeidler, Unterpfaffenhofen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 21, 1973, Ser. No. 399,635
Claims priority, application Germany, Oct. 3, 1972, 2248372
Int. Cl. H01s *3/10*
U.S. Cl. 330—4.3 **1 Claim**

1. An intermediate amplifier for a communications transmission system for transmitting communications by way of light waves in optical wave guides, said intermediate amplifier comprising an optical amplifier for amplifying the light waves according to the laser principle, means for electrically pulse pumping said optical amplifier upon receipt of light pulses at said optical amplifier, said pumping means including an electronic amplifier, a photo diode connected to said electronic



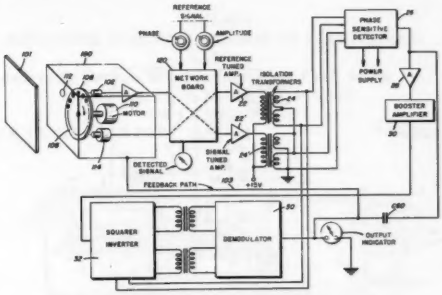
amplifier and receiving a portion of the incoming light power of the light pulses, said optical amplifier operable in response to said light pulses to provide said optical amplifier with pumping pulses at those times at which subsequent light pulses pass through said optical amplifier.

3,887,877

FEEDBACK ELECTROSTATIC VOLTMETER

Robert E. Vosteen, 15 W. Center St., Medina, N.Y.

Continuation of Ser. No. 66,444, Aug. 24, 1970, abandoned, which is a division of Ser. No. 567,973, July 26, 1966, Pat. No. 3,525,936. This application Mar. 26, 1973, Ser. No. 344,511
Int. Cl.[2] H03F *3/38*
U.S. Cl. 330—10 **4 Claims**



1. A high gain amplifier system comprising:

an operational amplifier having an input and an output,

a square wave drive source of predetermined frequency,

a first inverter means having first and second transistors, each having a base, an emitter and a collector electrode, the source of square waves being connected across the base electrodes of the first and second transistors to alternately drive them into conduction at the predetermined frequency.

a first step-up transformer having a center-tapped primary winding and a secondary winding, the primary winding being connected across corresponding electrodes of the first and second transistors other than the base electrodes, the remaining corresponding electrodes of the first and second transistors other than the base electrodes being connected to form a first common connection,

a second inverter means having third and fourth transistors, each having a base, an emitter and collector electrode, the source of square waves being connected across the base electrodes of the third and fourth transistors to alternately drive them into conduction at the predetermined frequency,

a second step-up transformer having a center-tapped primary winding and a secondary winding, the primary winding being connected across corresponding electrodes of

the third and fourth transistors other than the base electrodes, the remaining corresponding electrodes of the third and fourth transistors other than the base electrodes being connected to form a second common connection, a power supply having positive and negative supply terminals, one of the supply terminals being connected to the center tap of the primary winding of the first step-up transformer, the other supply terminal being connected to the second common connection,

means connecting the output of the operational amplifier to feed the first common connection and the center-tap of the primary winding of the second step-up transformer, the first and second inverters thereby providing output signals to the first and second step-up transformers respectively dependent upon the magnitude and polarity of the output of the operational amplifier and modulated at the predetermined frequency,

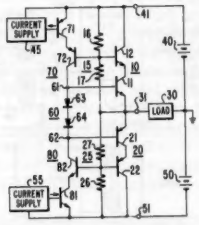
first and second demodulators connected to the secondary windings of the first and second step-up transformers respectively to demodulate the outputs thereof to produce high gain output signals.

3,887,878

TRANSISTOR SERIES AMPLIFIER

Otto Heinrich Schade, Jr., North Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 4, 1974, Ser. No. 447,934
Int. Cl. H03f *3/18*
U.S. Cl. 330—13 **18 Claims**



12. In combination:

a series amplifier comprising a first cascade of transistors, the principal conduction paths of which are connected in a first serial connection for direct current, and a potential divider for apportioning the potential appearing across said first serial connection to the control electrodes of all but the first transistors in said first cascade to cause the transistors in said first cascade to have substantially equal potentials across their principal conduction paths; and

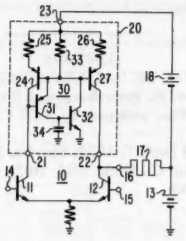
a second cascade of transistors, the principal conduction paths of which are in a second serial connection for direct current, and sharing said potential divider with said first series amplifier for apportioning the potential appearing across said first serial connection to the control electrodes of all but the first transistor in said second cascade to cause the transistors in said second cascade to have substantially equal potentials across their principal conduction paths, said second serial connection being connected to the control electrode of the first transistor of said first cascade thereby to cascade said first cascade after said second cascade.

3,887,879

CURRENT MIRROR

Jonathan Samuel Radovsky, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 11, 1974, Ser. No. 459,952
Int. Cl. H03f *3/42*
U.S. Cl. 330—19 **7 Claims**



1. A current amplifier comprising:

an input terminal, an output terminal and a common terminal;

first and second and third transistors of a first conductivity type and a fourth transistor of a second conductivity type complementary to said first conductivity type, each transistor having base and emitter and collector electrodes, the emitter electrodes of said first and said second transistors being direct current conductively coupled to said common terminal, the collector electrodes of said first and said second transistors being direct current conductively coupled respectively to said input terminal and to said output terminal, the base electrode of said third transistor having said input terminal direct coupled thereto, the emitter electrode of said third transistor having the base electrodes of said first and said second transistors coupled thereto; the collector electrode of said third transistor being direct coupled to the base electrode of said fourth transistor, the collector electrode of said fourth transistor being direct coupled to said first transistor base electrode and to said second transistor base electrode; and

means connected to the emitter electrode of said fourth transistor for biasing said fourth transistor for common-emitter amplification.

3,887,880

BIAS CIRCUITRY FOR STACKED TRANSISTOR POWER AMPLIFIER STAGES

Arthur John Leidich, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 24, 1973, Ser. No. 363,563
Int. Cl. H03f *3/04*
U.S. Cl. 330—22 **9 Claims**

1. An amplifier comprising, in combination:

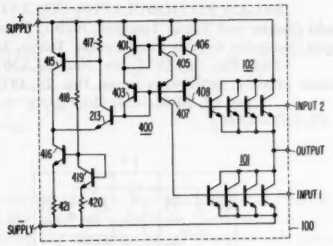
first and second transistors of the same conductivity type, each having emitter, base and collector electrodes, each having the same common-emitter forward current gain denominated beta;

first and second terminals for the application of an energizing potential therebetween and a third terminal, said first transistor emitter electrode being connected to said first terminal, said first transistor collector electrode and said second transistor emitter electrode each being connected to said third terminal, said second transistor collector electrode being connected to said second terminal;

auxiliary transistor means, including emitter electrode means and collector electrode means and base electrode means, and being thermally coupled to said first and second transistors;

means connected between the emitter electrode means and collector electrode means of said auxiliary transistor means for causing a constant current flow therebetween within said auxiliary transistor means; and

first and second current amplifier means, each having a constant and temperature-independent current gain of substantially equal value to the current gain of the other,

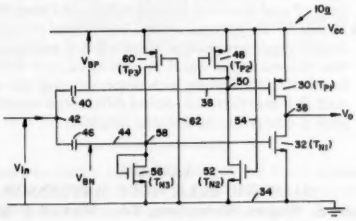


each having an input circuit connected to the base electrode means of said auxiliary transistor means to receive an input current therefrom, and each having an output circuit for responding to its input current to provide an oppositely directed output current, the output currents being respectively applied to separate ones of the base electrodes of said first and said second transistors.

3,887,881
LOW VOLTAGE CMOS AMPLIFIER

Kurt Hoffmann, Sunnyvale, Calif., assignor to American Micro-Systems, Inc., Santa Clara, Calif.

Filed Jan. 24, 1974, Ser. No. 436,151
Int. Cl. H03f *3/16*
U.S. Cl. 330—35 **5 Claims**



1. An amplifier comprising:

a pair of amplifying transistors connected to a common output junction, including a first transistor connected to a voltage supply line and a second transistor connected to a ground-line;

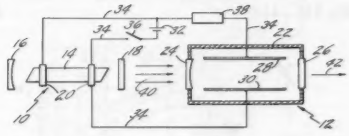
a first lead extending from an input junction to the gate of said first amplifying transistor and a second lead extending from said input junction to the gate of said second amplifying transistor, each of said leads being connected through a capacitor means for preventing the flow of direct current; and

a pair of divider networks connected to said voltage supply line and said ground-line, each said network comprising a pair of biasing transistors connected in series and with a junction between them connected to at least one of said leads for the gates of said amplifying transistors.

3,887,882
ELECTRIC DISCHARGE LASER WITH ELECTROMAGNETIC RADIATION INDUCED CONDUCTIVITY ENHANCEMENT OF THE GAIN MEDIUM

David C. Smith, Glastonbury, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Aug. 1, 1972, Ser. No. 277,023
Int. Cl. H01s *3/09*
U.S. Cl. 331—94.5 P **12 Claims**



3. A gas laser for producing energy in the form of coherent electromagnetic radiation comprising:

an optical resonator for producing laser radiation oscillations with a gain medium;

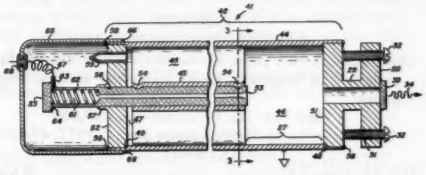
means for producing radiation which is injected into the resonator and absorbed by the gain medium thereby enhancing the electrical conductivity of the gain medium; and

means for passing a nonarcing electric current through the conductivity enhanced gain medium to produce a population inversion in the energy levels of the gain medium.

3,887,883
GAS LASER TUBE AND METHOD OF FABRICATING SAME

Lewayne E. Garman, 938 Iris, Sunnyvale, Calif. 94086

Filed Oct. 29, 1973, Ser. No. 410,608
Int. Cl. H01s *3/22*
U.S. Cl. 331—94.5 PE **7 Claims**



1. In a gas laser tube:

a hollow elongated unipotential metallic envelope means;

metallic wall means extending transversely of said envelope means in axially spaced relation as unipotential portions of said envelope means;

means for defining at least a portion of a gas tight enclosure within said envelope means between said metallic transverse wall means;

an elongated electrically insulative glow discharge tube disposed within said elongated metallic envelope means in axial alignment therewith;

support means disposed (within said envelope means) intermediate said transverse wall means for supporting said glow discharge tube from that portion of said hollow metallic envelope means intervening between said transverse wall means;

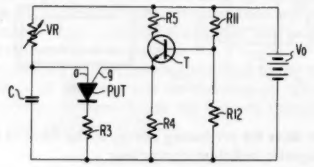
means defining an optical resonator disposed in axial alignment with said glow discharge tube;

means filling said glow discharge tube with a fluid laser gain medium; and

means for establishing an electrical discharge within said gain medium within said discharge tube for supporting

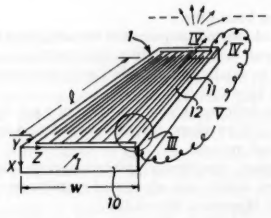
sustained stimulated coherent emission of optical radiation within said optical resonator of the laser.

3,887,884
RELAXATION OSCILLATOR
Takeshi Suzuki, Okazaki, Japan, assignor to Minolta Camera Kabushiki Kaisha, Japan
Filed Mar. 19, 1973, Ser. No. 342,390
Claims priority, application Japan, Mar. 17, 1972, 47-32865
Int. Cl. H03k *4/48*
U.S. Cl. 331—111 **2 Claims**



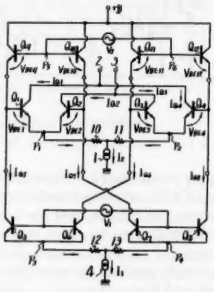
1. A relaxation oscillator comprising a D.C. power source, a programmable unijunction transistor having an N-shaped anode-voltage-current characteristic, a timer circuit including a variable resistor and a capacitor connected in series across said power source, said capacitor being connected between the anode and cathode of said programmable unijunction transistor, a second transistor having its emitter connected to the gate of said programmable unijunction transistor, the collector of said second transistor being connected through a resistance to one end of said power source, a fixed resistor connecting the emitter of said second transistor to the other end of said power source, and a voltage divider having its respective ends connected across said power source and a central point providing a divided output connected to the base of said second transistor.

3,887,885
ELECTROOPTIC MODULATOR
Shuzo Hattori, and Tadao Hiramatsu, both of Nagoya, Japan, assignors to Hagiwara Denki Kabushiki Kaisha, Nagoya, Japan
Filed Nov. 28, 1973, Ser. No. 419,869
Claims priority, application Japan, Dec. 4, 1972, 47-121353
Int. Cl. H01s *3/10*
U.S. Cl. 332—7.51 **8 Claims**



1. An electrooptic modulator comprising:
an electrooptic crystalline medium having a front side and rear side and a surface therebetween of a plane defined by rectangular coordinate first and second axes;
electrodes provided on said surface to cause in said medium and subjacent said surface an electrostatic field which is spatially periodic in a direction of said first axis and uniform in a direction of said second axis;
a first means to apply to said electrodes a voltage variable in accordance with a modulating signal; and
a second means to couple onto the front side of said medium an incident beam of electromagnetic energy with flat-aligned planes toward a direction of said second axis and in such an angle range that said beam propagates in said medium to be totally reflected at an inside of said surface, said medium delivering modulated output beams from the rear side thereof.

3,887,886
BALANCED MODULATOR CIRCUIT
Takashi Okada, and Takao Tsuchiya, both of Kanagawa-ken, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Dec. 26, 1973, Ser. No. 428,136
Claims priority, application Japan, Dec. 29, 1972, 48-548
Int. Cl. H03c *1/54;* **H03f** *3/26*
U.S. Cl. 332—43 B **15 Claims**

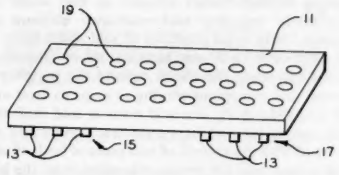


1. A balanced modulator circuit comprising:
A. a first differential amplifier comprising:
1. first and second input terminals, and
2. first and second output terminals;
B. a second differential amplifier comprising:
1. third and fourth input terminals, and
2. third and fourth output terminals connected respectively, to said second and first output terminals of said first differential amplifier;
C. means for supplying a first input signal differentially to each of said first and second differential amplifier;
D. means for supplying a second input signal to said first and second input terminals in one condition and for supplying said second input signal to said third and fourth input terminals differentially with respect to said one condition such that said first and second differential amplifier comprise a composite differential amplifier.

3,887,887
ACOUSTIC BULK MODE SUPPRESSOR
Rogert S. Wagers, Richardson, Tex.; Michael J. Birch, Rothersthorpe, England; Clinton S. Hartmann, and Donald F. Weirauch, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Dec. 28, 1973, Ser. No. 429,476
Int. Cl. H03h *9/30, 9/32, 9/26*
U.S. Cl. 333—30 R **4 Claims**

1. An acoustic surface wave device comprising:
a substrate of piezoelectric material having a parallelepiped configuration,
said substrate having a pair of major surface areas in spaced parallel relationship with respect to each other and defining top and bottom surfaces respectively thereof,
at least one acoustic surface wave transducer disposed on said top surface of said substrate for generating acoustic surface waves propagating along said top surface of said substrate, and
means defining a multiplicity of topographic deformations on the bottom surface of said substrate, said multiplicity

of topographic deformations being spaced apart in a random pattern and having respective width dimensions on the order of magnitude of one-half acoustic wavelength of the acoustic surface waves to be generated by said at least one acoustic surface wave transducer disposed on the top surface of said substrate, and the spacing



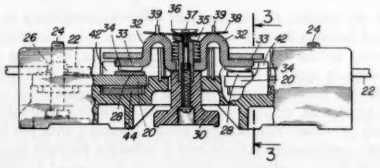
between adjacent ones of said topographic deformations being of the order of magnitude of the acoustic wavelength along the direction of propagation of acoustic surface waves to be generated by said at least one acoustic surface wave transducer disposed on the top surface of said substrate.

3,887,888

HIGH CURRENT SWITCH

John Bayles, East Dover, Vt.; Randall C. Bremer, East Granby, Conn.; George E. Gauthier, Farmington, Conn.; Frank J. Nascimbeni, Avon, Conn., and Robert J. Petitjean, Simsbury, Conn., assignors to Arrow-Hart, Inc., Hartford, Conn.

Filed Apr. 4, 1973, Ser. No. 347,460
Int. Cl. H01h *77/08*
U.S. Cl. 335—195 **5 Claims**



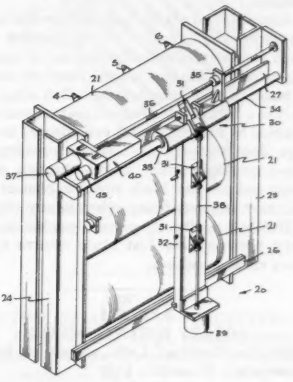
1. An electric switch comprising a pair of fixed contact members and a bridging contact member movable into and out of engagement with said fixed contact members, a pair of members of ferro-magnetic material for each pair of fixed and movable contact members forming a loop through which extends at least one contact supporting member of each pair thereof, one magnetic member of each pair thereof being secured to said bridging contact member, said magnetic members providing a flux concentrating path for electro-magnetic flux around said loop-penetrating current-conducting members whereby on occurrence of a short circuit in the electric circuit including said contacts, said one magnetic member is attracted toward the other magnetic member and said contacts are held in engagement by a force proportional to the current flow through said contact members, and operating means carrying said bridging contact member, and anti-rocking means carried by said operating means acting on said bridging contact member in switch-closed position to prevent rocking of the contacting surfaces of said bridging member on the contacting surfaces of said fixed contact members in switch-closed position on a short circuit condition.

3,887,889

HIGH POWER VARIABLE AUTOTRANSFORMER

Frank J. Karlov, Park Ridge; Leonidas Sidorewicz, Chicago; Charles L. Redfield, Woodridge, and Robert Evans, Evanston, all of Ill., assignors to Litton Medical Products, Inc., Elk Grove, Ill.

Filed Nov. 28, 1973, Ser. No. 419,694
Int. Cl. H01f *21/00, 29/00*
U.S. Cl. 336—146 **13 Claims**



1. A transformer comprising:

a first continuous winding forming a plurality of turns;

means for contacting individual turns of said winding, said means comprising a metal contact movably mounted on a carriage, said contact having a bearing surface for engaging said turns;

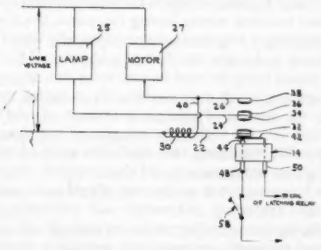
means for axially moving said metal contact along the length of said winding and positioning said metal contact approximately over any desired turn of said winding; and indexing means for automatically centering said metal contact exactly over the midpoint of any selected turn, said indexing means including means for sensing the position of said metal contact with said selected turn and moving said metal contact, in response to the sensed information, to the midpoint of said selected turn.

3,887,890

SWITCH MECHANISM ENSURING THE AUTOMATIC CLOSING OF A MOTOR-OPERATED GARAGE DOOR

Florian Lafontaine, 10747 Hotel de Ville, Montreal Nord, Quebec, Canada

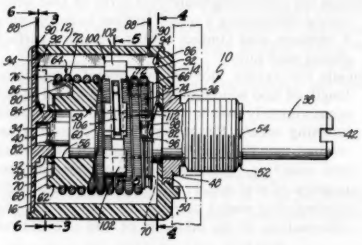
Filed Mar. 8, 1974, Ser. No. 449,269
Int. Cl. H01h *71/16*
U.S. Cl. 337—103 **4 Claims**



1. A switch mechanism for ensuring the automatic closing of a motor-operating garage door after said door has reached a fully opened position, comprising, in combination:

a. a thermostatic switch for providing delayed switch action including:
   i. a first bi-metallic blade having an electric heating element mounted longitudinally thereon; said heating element operating on said blade when energized by a motor-operating current;
   ii. a second blade adjacently spaced from said first blade for turning on an electric lamp when contacted by said first blade when temperature raises in said heating element;
   iii. a third blade adjacently spaced from said second blade for short-circuiting said heating element when energized for an excessively long period of time;
b. a second switch having contacts normally closed by said first blade of said thermostatic switch when the garage door is in a fully closed position; said second switch being connected to a latching relay coil adapted to operate the garage door motor; said contacts opening when said motor-operating current passes through said heating element and said first blade moves to contact said second blade; said contacts being subsequently closed by said first blade when, after the garage door has reached a fully opened position, said first blade returns to itis initial contact closing position.

3,887,891
ROTARY POTENTIOMETER
Billy Harold Tice, Carlsbad, Calif., assignor to Polaris Industrial Enterprises, Oceanside, Calif.
Filed Sept. 28, 1973, Ser. No. 401,687
Int. Cl. H01c 5/02
U.S. Cl. 338—145 **4 Claims**

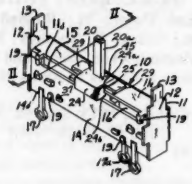


1. A potentiometer having a cylindrical housing, a rotor rotatably mounted in said housing, means for rotating said rotor, a resistance element coiled around said rotor, slider means extending between the interior of said housing and said resistance element for establishing electrical contact with said resistance element as said rotor is turned and two terminal means, each of said terminal means establishing electrical contact between an end of said resistance element and the exterior of said housing in which the improvement comprises: each of said terminal means having two parts, the first of said parts comprising a ring located concentrically about the axis of rotation of said rotor, the first of said parts of both of said terminal means being located on said rotor, the second of said parts comprising brush means resiliently engaging the associated ring, the second of said parts of both of said terminal means being located within the interior of said housing and including yokes straddling said shaft, the ends of said yokes comprising said brush means, said rings on both of said terminal means being mounted on the ends of said rotor and include resilient tabs extending underneath said resistance element, said tabs being located adjacent to the ends of said resistance element and resiliently engaging said resistance element so as to serve as end terminals therefor,

said slider means including a slider body positioned within said housing between the exterior of said rotor and the interior of said housing, an electrical conductor mounted on the interior of said housing so as to extend parallel to the axis of said rotor, rail means engaging said slider body and extending parallel to the axis of rotation of said rotor located on the interior of said housing, said rail means being engaged by said slider body so that rotation of said slider body is prevented, guide means located on said slider body for engaging said rotor for moving said slider body along said rail means as said rotor is rotated, and spring contact means located on said slider body for resiliently engaging said resistance element and said contact strip in all positions of said slider body,

said rings on both of said terminal means including extensions extending therefrom beyond the periphery of said rotor, said extensions serving as stops to limit movement of said slider body and said rotor as said shaft is rotated, tab means for making an electric connection integrally formed with the second of said parts of both of said terminal means, said tab means extending from the interior of said housing to the exterior of the periphery of said housing.

3,887,892
VARIABLE RESISTANCE SLIDE CONTROL
Arthur L. Rozema; John D. Saik, and Mervin B. Arisman, all of Elkhart, Ind., assignors to CTS Corporation, Elkhart, Ind.
Filed July 16, 1973, Ser. No. 379,719
Int. Cl. H01c 9/02
U.S. Cl. 338—183 **18 Claims**



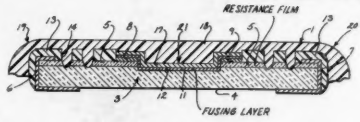
1. A variable resistance slide control comprising an elongated housing having a front wall and a side wall extending normal to the front wall, a dielectric base mounted to the housing in spaced parallel relationship to the side wall, the dielectric base having a top edge abutting against the edge of the front wall and having a bottom edge, the dielectric base being provided with notches communicating with the bottom edge, a resistance element and a collector element supported on the base, a plurality of terminals connected to the resistance element and to the collector element for connecting the control to an external electrical circuit, the terminals being partially received in the notches provided in the base, control operating means supported for movement relative to the housing, a contactor constrained to move with the control operating means, the contactor wipably engaging said resistance element and the collector element, the edge of the front wall of the housing and the top edge of the dielectric base being spaced from each other and defining an elongated slot, the control operating means having a portion extending through the slot and bearing against the front wall.

3,887,893
FUSIBLE RESISTOR
Ivan L. Brandt, Fox Point, and Theodor von Alten, Grafton, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.
Filed Sept. 24, 1973, Ser. No. 400,236
Int. Cl. H01c 1/00
U.S. Cl. 338—262 **16 Claims**

1. A fusible resistor, the combination comprising:
a cylindrical substrate made of an electrically insulating material and having ohmic contacts disposed at its ends;

a pair of lead wires fastened to the ends of said cylindrical substrate and in electrical contact with said ohmic contacts;

a resistive film deposited on the surface of said cylindrical substrate between said ohmic contacts, said resistive film being divided into two resistor sections by a gap which



interrupts electrical continuity between said lead wires; and

a fusible link deposited on said substrate and within said gap to provide electrical continuity between said resistor sections at normal operating temperatures, said fusible link including a fusing layer which melts at a preselected temperature to open circuit.

3,887,894

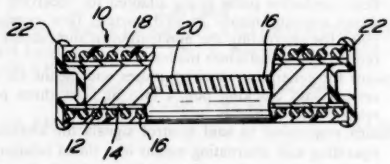
HELICAL RESISTOR

Floyd R. Rudd, North Wales, and George D. MacKenzie, Maple Glen, both of Pa., assignors to TRW Inc., Cleveland, Ohio

Division of Ser. No. 311,355, Dec. 4, 1972, Pat. No. 3,849,878. This application Dec. 26, 1973, Ser. No. 428,041

Int. Cl. H01c *1/02*

U.S. Cl. 338—264 **4 Claims**



1. A resistance element comprising

a wire core having ends and a cylindrical outer surface,

a cylindrical insulating layer on the outer surface of the core with said layer having ends extending beyond the ends of the core which are recessed therefrom,

a resistance wire helically wound around the insulating layer along the length of the insulating layer and about the extending ends of the insulating layer, and

a protection layer around the resistance wire winding.

3,887,895

CLAMPING ARRANGEMENT AND METHOD

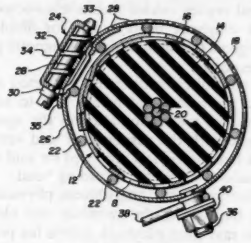
Chester E. Pierzchala, Wheaton, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.

Filed Jan. 7, 1974, Ser. No. 431,473

Int. Cl. H01r *3/06*

U.S. Cl. 339—14 R **6 Claims**

1. A ground clamping arrangement for forming a conductive connection with an electrical cable having a conductive core, a surrounding jacket of insulating material, and a series of grounding wires helically disposed over said insulating jacket in substantially concentric relation therewith and with the wires being circumferentially spaced apart, said arrangement being remote from a cable splice or termination and comprising a member deformable into a collar radially interposed between the jacket and the grounding wires, and a clamp having an electrically conductive ring for enveloping said wires in the region of said collar and including means for constricting said ring to apply radially inward pressure against said wires and cause said wires to impinge snugly upon said collar, and means preventing constriction of said collar under pressure from said ring, thereby to prevent diametral reduction of said jacket, said grounding wires being continuous and



maintaining their helical lay across the width of said collar and for substantial distances on opposite sides of said arrangement.

3,887,896

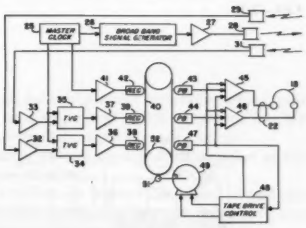
ACTIVE SONAR IMAGE PERCEPTION

Clarence F. Ramstedt, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 18, 1974, Ser. No. 461,840

Int. Cl. G01s *9/66, 7/54*

U.S. Cl. 340—3 R **12 Claims**



1. A swimmer carrier active sonar system comprising;

ensonifying means for projecting acoustic energy into a volume of water adjacent the swimmer;

two spaced hydrophone means held in spaced relation to said ensonifying means for receiving echo returns from the acoustic energy in a stereo information pattern and converting them to electrical signals;

master clock means connected to said ensonifying means for production of clock signals having a predetermined frequency;

stereo information processing circuitry connected to said two spaced hydrophones for processing the electrical signals;

first magnetic recording head means connected to said stereo information processing circuitry for making a recording field adjacent thereto;

second magnetic recording head means effectively connected to said master clock means for producing a recording field adjacent thereto in response to the clock signals;

a magnetic tape positioned adjacent said first and second magnetic recording head means in the associated recording fields to record the magnetic fields adjacent thereto; two speed tape transport means operatively engaging said magnetic tape for movement past said magnetic recording head means;

first magnetic playback head means positioned adjacent said magnetic tape to respond to signals recorded thereon by said first magnetic recording head means;

second magnetic playback head means positioned adjacent said magnetic tape to respond to signals recorded thereon by said second magnetic recording head means;

stereo signal replay circuit means connected to said first magnetic playback head means for amplifying the recorded signals to which said first magnetic playback head means responds;

tape drive control circuit means connected to said second magnetic playback head means and to said two speed tape transport means for altering the speed thereof in accordance with the response of said second magnetic playback head to signals recorded on said magnetic tape by said second magnetic recording head;

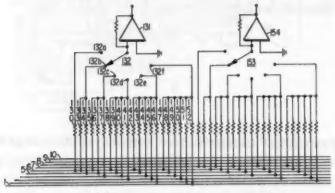
binaural electroacoustic transducers physically positioned adjacent the ears of the swimmer and electrically connected to said stero playback means for providing a spatial, aural reconstruction of echo return impinging said two spaced hydrophone means, whereby the diver may aurally locate the object producing the echo return during periods of replay at the lower of the two speeds of said tape transport due to heightened stereophonic illusion.

3,887,897

SYSTEM FOR CHANGING SEISMIC DETECTION ARRAY LENGTHS

Edwin B. Neitzel, Dallas, and Marvin D. Gontarek, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed July 23, 1973, Ser. No. 381,812
Int. Cl. G01v *1/16*
U.S. Cl. 340—7 R **10 Claims**



1. Means for varying the effective seismic detector array length while maintaining constant the effective detector array spacing in a seismic surveying system where an array channel from each detector array in a seismic spread leads to a multichannel recorder, comprising:

a. a plurality of multi-state input/output channel selectors, each connected at one input thereof to one of said array channels by means of first weighting means leading to first input terminals of said selectors,

b. connections between pairs of said array channels from adjacent detector arrays each by means of pairs of second weighting means leading to second input terminals of said selectors, and

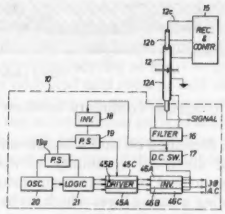
c. means for selectively connecting inputs of said recorder to said first or said second output terminals of said selectors.

3,887,898

WELL LOGGING SYSTEM USING 3 PHASE AC POWER SUPPLY

John M. Jones, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Aug. 20, 1973, Ser. No. 389,857
Int. Cl. G01v *1/40*
U.S. Cl. 340—18 R **7 Claims**



1. A logging tool for use in a well bore where an electrical direct current is supplied via an armored logging cable to such tool,

said logging tool including a fluid tight housing for containing a system for converting such electrical direct current into three phase alternating current, said system comprising

plural inverter means including plural transformer means for receiving direct current and conductor paths for providing current flow paths in opposite directions through primary windings of said transformer means, said current flow conductor paths being adapted for receiving such direct current, means in said current flow conductor paths for alternating the application of such direct current to said transformer means,

means for generating clocking pulses and means for converting said clocking pulses into at least three phase related control signals, and

means responsive to said control signals for electrically operating said alternating means in a timed relationship for producing at least three, phase related alternating current outputs for input to said primary windings of said transformer means.

3,887,899

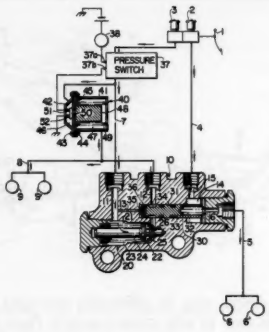
DUAL BRAKE SYSTEM FAULT DETECTION DEVICE

Hiroshi Kawaguchi, and Kiyoshi Nishiwaki, both of Shizuoka-ken, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Apr. 24, 1974, Ser. No. 463,689
Claims priority, application Japan, June 21, 1973, 48-69178
Int. Cl. B60t *8/26, 17/22*
U.S. Cl. 340—52 C **4 Claims**

1. A fault detecting device for a vehicle dual brake system having brake actuating means, a front brake system including a front master cylinder and front wheel cylinders, a rear brake system including a rear master cylinder and rear wheel cylinders, conduit means operatively connecting said master cylinders to apply braking fluid pressure to said wheel cylinders to brake said vehicle in response to operation of said actuating means, and regulating valve means provided in said rear brake system for regulating the braking fluid pressure applied in said rear wheel cylinders, said fault detection device comprising an alarm circuit including signal means for providing an indication of a fault in said system upon actuation of said circuit, first and second pressure-sensitive switches each operatively associated with said alarm circuit and adapted to be switched between a circuit activating condition and a circuit deactivating condition in response to pressure applied thereto, said first pressure-sensitive switch being connected to sense pressure in said rear master cylinder and to switch to said circuit-

activating condition when said rear master cylinder pressure reaches a predetermined level, said second pressure-sensitive switch being connected to sense a difference between master cylinder pressure and wheel cylinder pressure and switch to said circuit deactivating condition when the sensed difference reaches a predetermined level, said alarm circuit being operative to generate a fault-indicating signal when both said switches are in the circuit-activating condition.

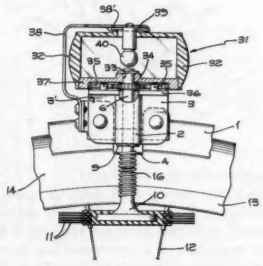


3,887,900

ROTATING BICYCLE SIGNAL AND DRIVE THEREFOR

Gerald Lawrence Goedert, 1907 E. Rowland Ave., Camarillo, Calif. 93010

Filed July 1, 1974, Ser. No. 484,680
Int. Cl. B62j *3/00, 5/00;* **B60q** *1/26*
U.S. Cl. 340—134 **6 Claims**



1. A rotatable signaling device for a bicycle or the like, comprising:

resilient means for translating and transmitting rotation of a bicycle wheel about a horizontal axis into rotation of a shaft about a virtually vertical axis;

journal means for supporting a shaft for rotation about a virtually vertical axis, said journal means including means for connecting the journal means to a bicycle frame;

a shaft in said journal means;

a light-transmitting and reflecting signal mounted for rotation by said shaft about a vertical axis;

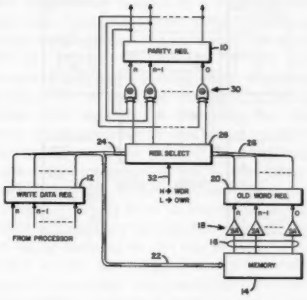
and a resilient, shock-absorbing torsion-transmitting coupling between the signal and said shaft.

3,887,901

LONGITUDINAL PARITY GENERATOR FOR MAINFRAME MEMORIES

Harry Winthrop Moore, III, Lakeland, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 29, 1974, Ser. No. 465,014
Int. Cl. G06f *11/10*
U.S. Cl. 340—146.1 AG **3 Claims**



1. A circuit for continuously generating a longitudinal parity word each time a new item of data is entered into a computer memory device comprising in combination:

a. a memory for storing digital information at addressable locations therein;

b. A first multistage register connected to said memory for at least temporarily storing a data word to be entered into said memory at a predetermined address;

c. a second multistage register connected to the output of said memory adapted to at least temporarily hold the data word stored in said memory at said predetermined address which is to be replaced with the data word in said first register;

d. a longitudinal parity word register having a number of individual stages equal in number to the size of said data word for storing a binary number representative of the parity word which when added to the words stored in said memory will cause the total number of bits occupying a given bit position in all of said words in said memory to be odd or even;

e. a plurality of Exclusive OR logic circuits equal in number to the number of bits in said data words having first and second input terminals and an output terminal, said output terminal of each of said logic circuits being connected individually to an input of a separate one of said stages of said parity word register;

f. means connecting the output of each of said stages in said parity word register individually to the first of said input terminals of said logic circuit associated with that stage; and

g. means for alternately connecting the outputs from the individual stages of said first and second registers to said second terminal of said logic circuit associated with the corresponding stage of said parity word register.

3,887,902
METHOD AND APPARATUS FOR PROCESSING CALLS DISTRIBUTED RANDOMLY IN TIME AND REQUIRING RESPONSE DELAYS OF ANY DURATION, BUT SPECIFIED FOR EACH CALL

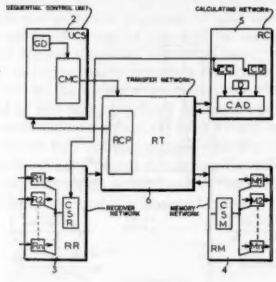
Pierre Labalme, Paris, France, assignor to Compagnie Honeywell Bull (Societe Anonyme), Paris, France

Filed Sept. 25, 1973, Ser. No. 400,578

Claims priority, application France, Sept. 29, 1972, 72.34508

Int. Cl. G06f *9/16, 9/19;* **G04c** *23/38*

U.S. Cl. 340—172.5 **15 Claims**



1. A circuit for processing calls distributed randomly in time and generated by a plurality of devices, each call being accompanied by a delay data item which represents the response delay required by the calling device in terms of a multiplier to be assigned to a predetermined minimum time interval *d*, comprising:

a sequential control unit for controlling the operation of said circuit in cycles and for providing a succession of control order signals during each cycle;

a plurality of call receivers, one receiver for each device;

a sequential selection circuit for sequentially selecting said call receivers in response to said control order signals;

a plurality of alterable memories, one alterable memory for each device, each of said memories comprising means for chaining into a circular waiting queue a memory assigned to calling devices;

a calculating network responsive to said control order signals for generating a first representation of the number of said cycles of operation of said circuit, a second representation of the number of said calling devices for which memories are chained into said queue, and a sum representation of the quantities represented by said first and second representations; and

a transfer network responsive to said control order signals and coupled sequentially to said memories, to the ones of said call receivers selected by said selection circuit, and to said calculating network, for transferring to one of said memories the delay item provided by a calling device and the current sum representation generated by said calculating network.

3,887,903
INTERACTIVE MAN-MACHINE METHOD AND SYSTEM FOR GRADING PATTERN PIECES AND FOR PRODUCING AN APPAREL MARKER

Charles Ronald Martell, Dallas, Tex., assignor to Camsco, Inc., Richardson, Tex.

Filed Aug. 29, 1973, Ser. No. 392,651

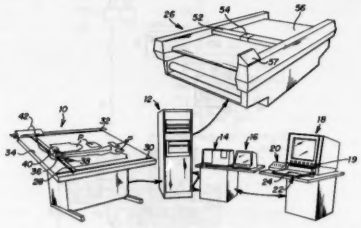
Int. Cl. G06f *3/14*

U.S. Cl. 340—172.5 **30 Claims**

1. A system for laying out an apparel pattern marker wherein a plurality of apparel pattern pieces are arranged within a predetermined marker area comprising:

screen means for displaying to an operator scaled miniature representations of said pattern pieces adjacent a scaled miniature representation of said marker area;

positioning means movable by the operator to selectively move said representations of said pattern pieces one at a time on said screen means to within said representation of said marker area, wherein said representations of said



pattern pieces may be efficiently arranged within said representation of said marker area to form a simulated marker; and

means responsive to the orientation of said representations of said pattern pieces forming said simulated marker on said screen for plotting the full size marker layout of said pattern pieces in the predetermined full size marker area.

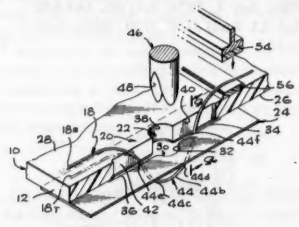
3,887,904
WIRE MASS TERMINATION

Niels Krag, Pacific Palisades, Calif., assignor to Electronic Memories & Magnetics Corp., Hawthorne, Calif.

Filed Aug. 22, 1973, Ser. No. 390,357

Int. Cl. G11c *5/08;* **H01f** *41/10*

U.S. Cl. 340—174 MA **11 Claims**



1. A circuit assembly comprising:

an insulating board having a plurality of holes;

a pad of conductive material surrounding each of said holes in the board, each pad having a slit with a portion lying within the boundary of a corresponding hole;

a plurality of electrical devices mounted on said board;

a plurality of wires coupled to said electrical devices and extending over a face of the board and through said holes and slits.

3,887,905
MAGNETIC DOMAIN SHIFTING ARRANGEMENT EMPLOYING MOVABLE STRIP DOMAIN

Andrew Henry Bobeck, Chatham, and Henry Evelyn Derrick Scovil, Gladstone, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

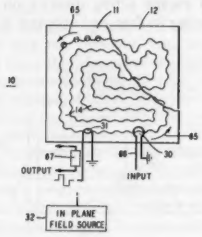
Filed Jan. 29, 1973, Ser. No. 327,625

Int. Cl. G11c *11/14, 19/00*

U.S. Cl. 340—174 TF **16 Claims**

1. Magnetic apparatus comprising a first layer of magnetic material having properties such as to be capable of having a

domain wall formed therein in response to the presence of a magnetic field in a first range, said wall extending between first and second positions in a manner to form an information channel therebetween in the absence of propagation-assisting physical structures, first means coupled to said layer for introducing a magnetic indication of information to said channel at



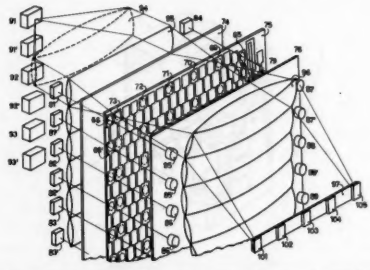
said first position, and second means also coupled to said layer for detecting said magnetic indication of information at said second position, said magnetic indication being moveable from said first to said second position in the presence of a magnetic field in said first range, said wall having properties such as to be operative in the presence of a magnetic drive field to move said indication therealong.

3,887,906

OPTICAL ASSOCIATIVE MEMORY USING COMPLEMENTARY MAGNETIC BUBBLE SHIFT REGISTERS

Nicola Minnaja, Milan, Italy, assignor to Honeywell Information Systems Italia, Caluso, Italy

Filed June 28, 1973, Ser. No. 374,624
Claims priority, application Italy, June 28, 1972, 26323/72
Int. Cl. G11c *11/16, 11/42, 15/00*
U.S. Cl. 340—174 GA **3 Claims**



1. An optical associative memory system, comprising an optical support for recording information by means of a variable optical response to illumination of elementary areas in dependence on the recorded information, the optical response of each elementary area of the support being dependent on the transparency of said elementary area in the presence of polarized incident the transmitted light, said recorded information comprising a plurality of words formed each by an ordered set of an equal number of bits, illuminating means for illuminating said support, and an array of electro-optical detector elements for generating electrical signals in response to the illumination of said detectors, said system being characterized in that:

each bit is recorded both in a first direct form and in a second inverse form, complementary to the first direct form;

said support comprises a plurality of bit regions, each one recording in the same form the bits of equal order of all the recorded words;

said illuminating means selectively illuminates at least one of said regions with polarized light;

said array of detector elements comprises a number of detectors equal to the number of words which may be recorded on the support;

the optical response of each bit region to the illumination is concentrated on said array of detector elements, each detector being responsive to the illumination resulting from the cumulative optical response of all the illuminated bits of a single word;

said recording support includes a plate of crystal of rare-earth orthoferrite subject to a magnetic field and provided on at least a face with a suitable pattern of electrical conductors for generating local variation in said magnetic field in response to electrical current flowing therethrough, for generating duplicating, displacing or cancelling magnetic bubbles, said conductors forming magnetic bubble shift registers for recording the information by means of the presence or absence in predetermined time intervals of magnetic bubbles in prearranged memory locations, the presence of said bubbles being detected as a variation of the optical response of said incident polarized light emerging from an analyzing device;

said shift registers are grouped in pairs of registers, each pair being assigned to the bits of equal order of all recorded words, homologous memory locations in each register of each pair being assigned for recording respectively in direct and inverse form the bits of the same word; said illuminating means selectively illuminates at least one of said registers; and

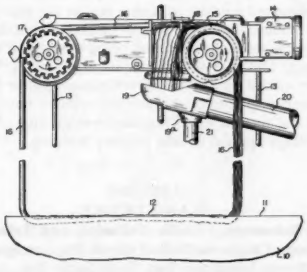
said system comprises in addition a "fly-eye" optical device for focusing and superimposing the images of the iluminated register on said array of detector elements.

3,887,907

OIL DETECTOR

Eugene L. Brill, 1803 W. Royalton Rd., Cleveland, Ohio 44147

Filed Nov. 12, 1973, Ser. No. 414,996
Int. Cl. G08b *21/00*
U.S. Cl. 340—236 **9 Claims**

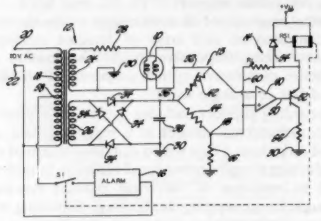


1. The method of detecting the presence of oil floating on water, comprising taking and collecting all of a continuous liquid sample from the surface of said water at a substantially steady rate using a hydrophobic collector having a greater affinity for oil than for water, collecting a continuous series of samples, each sample of predetermined parameter in a predetermined time constituting a cycle, dumping each sample at the end of each cycle, and providing a signal when a sample reaches said predetermined parameter in less than said predetermined time due to the presence of oil in said sample.

3,887,908
TOXIC GAS INDICATOR

David L. Swigert, Ypsilanti, Mich., assignor to Environmental Metrology Corp., Ann Arbor, Mich.

Filed May 7, 1973, Ser. No. 357,631
Int. Cl. G08b 17/10
U.S. Cl. 340—237 R 7 Claims



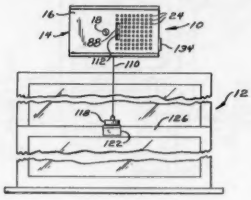
1. Apparatus for indicating the presence of a toxic gas comprising, a solid state sensor having a relatively large nominal resistance but being responsive to the presence of said toxic gas to present a substantially reduced electrical resistance characteristic, bridge circuit comprising as a first leg the series combination of said sensor and a variable resistor and as a second leg the series combination of two reference resistors, the first and second legs being connected in parallel, input circuit means including first means connected directly to said sensor for energizing said sensor with electrical energy of a predetermined magnitude for producing an electrical signal quantity related to the resistance characteristic of said sensor, said input circuit means further including second means connected across both of the first and second legs for energizing the bridge circuit and for producing a reference quantity, control circuit means including comparator means having separate inputs connected to the mid-points of said first and second legs for comparing said electrical signal quantity to said reference quantity and for producing an output signal quantity when said electrical signal quantity bears a predetermined relationship to said reference quantity, and indicator means for indicating an alarm condition connected to be controlled by said output signal quantity for indicating the presence of said gas, said input circuit means including a transformer having a tapped primary winding and first and second secondary windings, said tapped primary winding being connected to said indicator means for energizing said indicator means under the control of said output signal quantity, said first secondary winding being connected to energize said sensor, and said second secondary winding being connected by circuit means to said reference resistor to produce said reference quantity, whereby the relative energization of said first and second legs is constant irrespective of variations in the voltage applied to said primary winding.

3,887,909
ALARM DEVICE

John L. Beiswenger, Pacific Palisades, and Leland DeVon Jorgensen, Chippewa Falls, both of Wis., assignors to National Presto Industries, Inc., Eau Claire, Wis.

Filed Apr. 27, 1972, Ser. No. 248,050
Int. Cl. G08b 13/00, 13/08
U.S. Cl. 340—274 11 Claims

1. An alarm device for use in detecting movement of an object, comprising, in combination, housing means, electrically operated alarm generating means supported by said housing means, a source of electrical energy supported by said housing means, circuit means selectively electrically connecting said alarm generating means to said source of electrical energy, said circuit means including switch means having a pair of spaced fixed contacts and a movable contact arm therebetween and biasing means urging the movable contact arm to one and away from the other of said fixed contacts, said movable contact arm and fixed contacts being connected in said circuit such that said circuit means is closed when said contact arm is contacting either of said fixed contacts and open when said contact arm is disposed intermediate said fixed contacts, a rotatable reel member, means including a length of cord wound about said rotatable reel member, and releasable clutch means for resisting rotation of said reel member, said cord means acting directly on said movable contact arm and having its free end adapted to be secured to

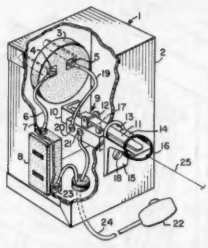


the object, said clutch means being releasable to permit unwinding of said cord means from said reel member to facilitate attachment of said cord means to the object and to take up slack in said cord means to place said cord means under tension of an amount sufficient to resist the force of the biasing means and hold said contact arm intermediate and out of engagement with said fixed contacts, whereby when said cord means is pulled, broken or otherwise disturbed said contact arm will be caused to contact one of said fixed contacts and to energize said alarm generating means.

3,887,910
BURGLAR ALARM

Vernon H. Jones, 2553 Falmouth Rd., Akron, Ohio 44313

Continuation-in-part of Ser. No. 306,709, Nov. 15, 1972, abandoned. This application Jan. 22, 1973, Ser. No. 325,741
Int. Cl. G08b 13/00
U.S. Cl. 340—276 14 Claims



1. A burglar alarm for use with an existing power circuit having a plurality of power outlet receptacles at various remote locations from each other the alarm comprising:

a. a trigger operated switch assembly connected between a power input and power output for turning off or on power from the input to the output, the power input of the switch assembly being plugged into one of the power outlet receptacles in an existing power circuit, said trigger operated switch assembly having a trigger operated switch and a trigger mechanism comprising:

1. a fixed trigger arm positioning member attached to the housing and extending outwardly therefrom,

2. a trigger arm operatively associated with the trigger operated switch and extending through an opening in the housing to a position adjacent the positioning member, an outwardly extending flange which is tapered from a larger

thickness at the inner end to a smaller thickness at the outer end to provide greater ease of removal of the retaining member, said trigger arm movable to and from the positioning member,

3. a spring clip retaining means simultaneously engaging the positioning member and the trigger arm to resiliently position the trigger arm with respect to the positioning member, thereby causing the switch to be in an open position, and

4. a release line having one end attached to the retaining member and the opposite end anchored at a remote location from the trigger mechanism,

5. whereby any tension exerted on the line will pull the retaining member out of engagement with the positioning member and the trigger arm and release the trigger arm thereby permitting the switch to close, and

a. a high frequency signal transmitter connected to the power output of the trigger operated switch assembly to send a high frequency signal through the power circuit when the trigger operated switch is closed;

b. a high frequency signal receiver connected to a predetermined location on the power circuit said receiver being responsive to signals transmitted by the signal transmitter over the power circuit to close a switch connected between an input and and output of the receiver; and

c. an electrically operated warning signal device connected to the output of the receiver to produce a warning signal when the trigger operated switch is closed and a high frequency signal from the transmitter causes the switch in the receiver to close thereby causing electrical current to flow to the warning signal device.

3,887,911

DIGITAL-TO-ANALOGUE CONVERTER FOR RAPIDLY CONVERTING DIFFERENT CODES

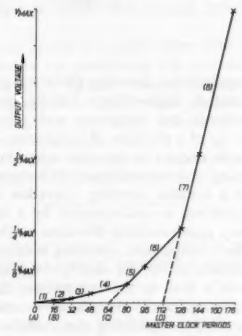
Philip Richard Bell, Chelmsford, England, assignor to The Marconi Company Limited, Chelmsford, Essex, England

Filed Feb. 15, 1973, Ser. No. 332,548

Claims priority, application United Kingdom, Feb. 24, 1972, 8562/72

Int. Cl. H03k *13/02*

U.S. Cl. 340—347 DA **3 Claims**



1. A digital-to analogue converter comprising, in combination:

storage means for storing successive digital codes during conversion thereof to corresponding analogue signals, each of said codes including certain bits identifying a straight line segment of a conversion law obeyed by the converter and other bits providing a digital number identifying whereabouts on said segment the corresponding analogue signal lies, at least two of said segments defining a straight line section having a predetermined positive slope starting from a finite minimum value of said corresponding analogue signal and which defines the beginning point of one line segment;

means responsive to said certain bits identifying either said two segments for producing a linearly increasing signal whose rate of increase corresponds to said predetermined slope whereby said signal reaches the level of said beginning point of said one line segment after a predetermined period of time;

counter means for counting clock signals to produce an increasing digital output number;

first clock signal means for producing a first clock signal of a frequency corresponding to m clock pulses during said predetermined period of time;

said one line segment having an end point which is reached by said linearly increasing signal after $m = k$ of said first clock pulses where k is the number of said first clock pulses required for said linearly increasing signal to increase from said minimum value to said end point;

second clock signal means for producing a second clock signal of a frequency corresponding to m second clock pulses during the time taken for said linearly increasing signal to reach said end point of said one line segment;

delay means for driving said counter means after m pulse inputs thereto;

comparator means for comparing the output of said counter means with the number represented by said other bits of a stored code;

switch means responsive to said certain bits of a stored code for connecting one of said clock signals to said counter means through said delay means; and

means for taking off the value of said linearly increasing signal when equality between the count of said counter means and that number represented by said other bits is reached.

3,887,912

ANALOGUE-DIGITAL CONVERTER APPARATUS

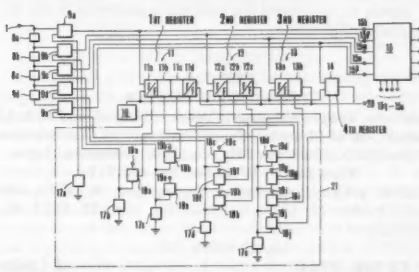
Mitomu Kuwamura, Tokyo, Japan, assignor to Iwatsu Electric Company, Japan

Filed Oct. 15, 1973, Ser. No. 406,462

Claims priority, application Japan, Oct. 20, 1972, 47-10563

Int. Cl. H03k *13/17*

U.S. Cl. 340—347 **3 Claims**



1. An analogue-digital converter apparatus comprising a plurality of analogue-digital converters of the same number as the number of bits (m) of the digital output, each of said analogue-digital converters acting to convert an analogue input into a digital output, a plurality of delay elements coupled to respective converters to successively apply said analogue input to said analogue-digital converters starting from the converter corresponding to the most significant digit toward the converter corresponding to the least significant digit with a predetermined time delay between the inputs to adjacent converters, a plurality of shift registers connected to receive and set respective outputs from said plurality of analogue-digital converters and to receive a shift pulse having a period equal to said predetermined delay time for successively shifting said outputs set in said shift registers, weight circuit

means connected to be controlled in accordance with the contents of said shift registers for supplying reference outputs successively to said analogue-digital converters starting from the converter corresponding to the most significant digit toward the converter corresponding to the least significant digit, said reference outputs being the combinations of 2^{m-1}, 2^{m-2} . . . 2^0 where m has the same meaning as above defined, and memory means for storing the outputs from said analogue-digital converters and for producing a digital output corresponding to said analogue input.

3,887,913

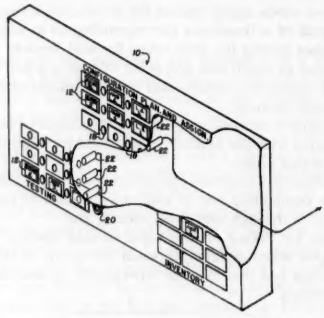
ELECTRONIC STATUS AND CONTROL BOARD

Edwin W. Smith, 13073 Via Latina, Del Mar, Calif. 92014

Filed Apr. 15, 1974, Ser. No. 460,853

Int. Cl. G09f *9/14*

U.S. Cl. 340—381 **5 Claims**



1. An electronic status and control board comprising:

a. a configuration area where coded tabs representing equipments to be configured into a system are positioned to display a desired system configuration,

b. sensing means for sensing the code of said coded tabs to provide selective switching signals,

c. actuating means positioned on the control board to activate said sensing means to generate selective switching signals to implement the assigned equipments in the desired configuration.

3,887,914

CONTACTLESS BUZZER

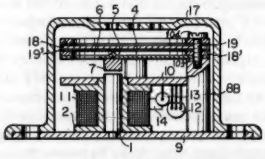
Yukio Sato; Youjiro Shigemori; Yoshio Mitumori, and Tadashi Suzuki, all of Shizuoka, Japan, assignors to Star Seimitsu Kabushiki Kaisha (Star Mfg. Co., Ltd.), Shizuoka, Japan

Filed Jan. 8, 1974, Ser. No. 431,811

Claims priority, application Japan, Jan. 9, 1973, 48-5954[U]; Mar. 22, 1973, 48-35310[U]; **Mar. 22, 1973, 48-35309**[U]

Int. Cl. G08b *3/00*

U.S. Cl. 340—384 R **5 Claims**



1. A contactless buzzer comprising a base, a plurality of spaced apart pillars secured to said based perpendicular thereto, vibrator arm means having a free end extending in parallel spaced relation to said base and including supporting means mounted on the tops of said pillars, resonator means disposed parallel to said base in contiguous relation to the upper surface of said supporting means and including a resonator disc and a pair of annular supporting rings disposed on opposite sides of said disc adjacent the circumference thereof and electro magnet means mounted on said base and including a coil and a core with said core being disposed perpendicular to said base in alignment with the free end of said vibrator arm means.

3,887,915

ARRANGEMENT FOR DETECTING DIELECTRIC BREAKDOWNS IN METAL-CLAD HIGH-VOLTAGE SWITCHING AND TRANSMISSION INSTALLATIONS

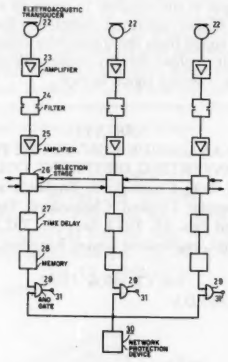
Willi Olsen; Manfred Lieske; Wolfgang Ehmann, and Gerhard Perst, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 18, 1974, Ser. No. 452,261

Claims priority, application Germany, Mar. 23, 1973, 2315323

Int. Cl. H02b *13/02*

U.S. Cl. 340—415 **9 Claims**



1. An arrangement for detecting dielectric breakdowns in a metal-encapsulated, high-voltage installation such as an equipment suitable for switching and transmitting high-voltages made up of a plurality of component sections sealed gastight one with respect to the other wherein breakers open and close causing an interrupting arc of known duration to be drawn during a breaker opening operation and wherein a dielectric breakdown is accompanied by a fault arc having noise frequency approximately the same as that of the interrupting arc, the arrangement operating in combination with a network protection device for issuing a signal in response to the presence of a fault in the installation, the arrangement comprising: electroacoustic transducer means disposed at a component section for detecting the sound waves generated by the fault arc and transmitted by the encapsulation; filter means for blocking signals from said transducer means having a frequency other than that of the fault arc; amplitude means for passing only said signals from said transducer means having a minimum amplitude whereby signals below said amplitude are not transmitted; time delay means for passing said signals from said transducer means having a duration greater than the duration of the interrupting arc; and, evaluation control means for issuing a signal indicative of a fault in response to the presence simultaneously of a signal from said time delay means and a signal from the network protection device.

3,887,916
CORRELATOR AND CONTROL SYSTEM FOR VEHICULAR COLLISION AVOIDANCE

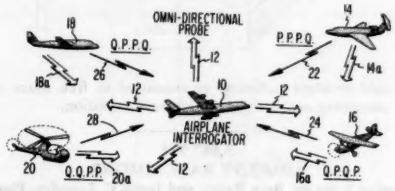
Ronald Bruce Goyer, North Hollywood, Calif., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 30, 1973, Ser. No. 355,448

Claims priority, application United Kingdom, June 27, 1972, 30036/72; Jan. 18, 1973, 2634/73; June 27, 1972, 30039/72; Apr. 13, 1973, 30036/73

Int. Cl. G01s 9/56

U.S. Cl. 343—6.5 LC **10 Claims**



1. A digital correlator comprising:

a. a source of random digital signals of varying pulse width,

b. means for periodically sampling said random signals to generate any one of two interrogation signals each having a distinguishing indicia from the other,

b1. said interrogation signals adapted for transmission to the environment once each period for interrogating the presence of remote stations,

b2. said remote stations having means responsive to said interrogation signals to generate and transmit to the environment a reply signal corresponding to the respective interrogation signals received by them,

b3. said remote stations further having means for periodically transmitting any one of two interrogation signals, corresponding to said first mentioned interrogation signals, generated in response to a random source different from said first mentioned random source,

c. means for receiving signals comprising said reply signals and interrogation signals from said remote stations,

d. means for discriminating said received signals into signals corresponding to either one of said two interrogation signals,

e. digital circuit means in synchronism with said periodic sampling means for comparing the transmitted and replied interrogation signals during each sampling period for providing any one of said two signals corresponding, respectively, to like and unlike correlations of the sampled and received signals, and

f. digital circuit means responsive to said comparison means for integrating the like and unlike signals.

3,887,917
DIGITAL RADAR TARGET IMAGING WITH HIGH RADAR RESOLUTION MONOPULSE RADAR

Dean D. Howard, and David C. Cross, both of Oxon Hill, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 4, 1972, Ser. No. 294,033

Int. Cl. G01s 7/20

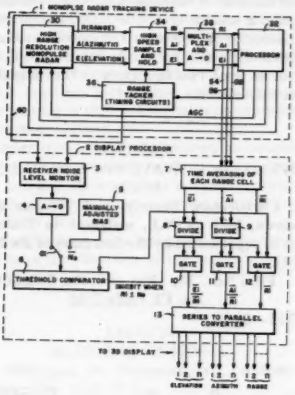
U.S. Cl. 343—7.9 **8 Claims**

1. In a three dimensional monopulse radar system:

display processor means adapted to receive elevation, azimuth and range amplitude signals from a monopulse radar tracking system using small aperture antennas and process said signals for display;

said display means comprised of a stacked series of display planes in a first dimension, each plane of which is capable of displaying data in two spacial dimensions different from said first dimension;

said three dimensional display means connected to receive said processed signals and to gate said signals to a particular location in the display in accordance with magnitude and occurrence of said signals in time.



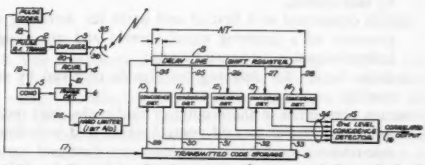
3,887,918
MULTI-LEVEL DIGITAL COINCIDENCE DETECTION

John S. Bailey, Woodland Hills, and David E. Hammers, Los Angeles, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 9, 1973, Ser. No. 358,617

Int. Cl. G01s 7/30

U.S. Cl. 343—17.2 R **6 Claims**



1. In a radar system having means for transmitting relatively long pulses each subdivided into a plurality of N substantially equal duration successive subpulses each coded in first or second radio frequency phase condition according to a predetermined program, and pulse echo receiving means, pulse compression means comprising: means responsive to said transmitting means for storing the code of said transmitted pulses as a series of one-bit digital codes corresponding discretely to said subpulses; phase detection means responsive to said receiving means for producing a sequence of bi-polar video pulses the polarities of which correspond discretely to said first and second radio frequency phase conditions; means responsive to said phase detection means for converting said video polarities to a one-bit digital code corresponding to each of said subpulses at the output thereof; delay means responsive to said one-bit code, said delay means having a transmission time at least as long as said relatively long transmitted pulses, said delay means having a number of taps corresponding to the number of said successive subpulses, said taps being spaced by a time substantially equal to the duration of one of said increments; a first level correlator comprising a first bank of G coincidence detectors, said coincidence detectors each connected to correlate a different predetermined fraction of the plurality of N subpulses of said transmitted pulse against the corresponding fraction of said subpulses in said means for storing the code of said transmitted pulses, said coincidence

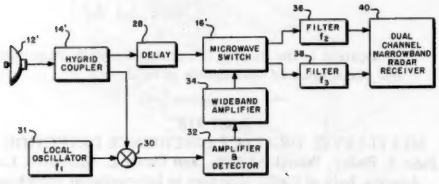
detectors connecting between corresponding groups of taps on said delay means and said means for storing the code of said transmitted pulses, said coincidence detectors each producing a single output providing a one bit code representing correlation success, or the lack of it, within the corresponding detector; and a second level correlator comprising a second bank of coincidence detectors responsive to the outputs of said first level correlator for producing a one bit output representative of at least two successes in the outputs of said G coincidence detectors.

3,887,919

HIGH SPEED MICROWAVE SWITCHING LOGIC FOR ECCM

James L. Christensen, Beverly, and Thomas B. Howard, Moorestown, both of N.J., assignors to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 30, 1966, Ser. No. 598,114
Int. Cl. G01s *7/36*
U.S. Cl. 343—18 E **6 Claims**



1. In a receiving system, an electronic counter countermeasures device for preventing a jamming signal from rendering a receiver inoperative, the device comprising:

means providing a pair of signal paths for signals received by said system;

means connected to a first of said paths for detecting the presence of a jamming signal therein and providing a control signal in response thereto;

a delay device for delaying the signals received by said system;

means connected to the second of said paths, said means being responsive to said control signal and including a microwave switch having an input and first and second outputs, said input for receiving the delayed signals from said delay device;

first and second filters connected to said first and second outputs for preventing jamming signals from passing therethrough; and

said microwave switch passing the delayed signals to said second filter only in the presence of said control signal.

3,887,920

THIN, LIGHTWEIGHT ELECTROMAGNETIC WAVE ABSORBER

Rufus W. Wright, Alexandria, Va., and John W. Wright, Accokeek, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 96,335, March 16, 1961, abandoned. This application Mar. 12, 1963, Ser. No. 265,590
Int. Cl. H01q *17/00*
U.S. Cl. 343—18 A **14 Claims**

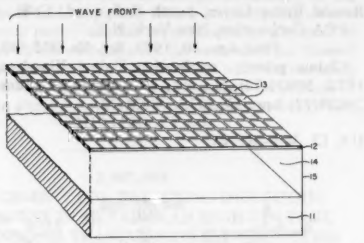
1. Means for absorbing microwave radiation incident on the surface of an object comprising, in combination;

an insulating sheet,

a thin film array of uniform geometric figures on a surface of said sheet,

said film being composed of a material whose electrical conductivity is greater than 0.1 mho per meter,

said sheet being positioned at a distance from the surface of said object substantially less than a quarter wavelength of



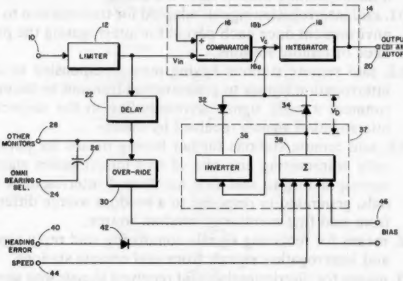
said incident radiation as measured in free space and absorbing said incident microwave radiation.

3,887,921

ADAPTIVE RATE LIMITER

Brendan J. Spratt, Boca Raton, and James C. Lunsden, Plantation, both of Fla., assignors to The Bendix Corporation, Southfield, Mich.

Filed Mar. 25, 1974, Ser. No. 454,508
Int. Cl. G01s *1/46*
U.S. Cl. 343—106 R **15 Claims**



1. An adaptive rate filter for use in an aircraft navigation system installed in an aircraft which includes receiver means for generating a navigation signal in response to a signal received from a remote station wherein said navigation signal includes at least a component related to the bearing of the receiver means from the remote station and including means for generating at least one voltage signal related to a predetermined aircraft parameter, said adaptive rate filter comprising:

means for generating a second voltage signal related to the difference of said component and a feedback signal;

means for limiting said second voltage signal at least in accordance with said one voltage signal; and,

means for integrating the limited second voltage signal, the absolute value of the results of the integration comprising the absolute value of said feedback signal.

3,887,922

INSTRUMENT LANDING SYSTEM WITH MICROWAVE COURSE PATTERN TRANSMISSION

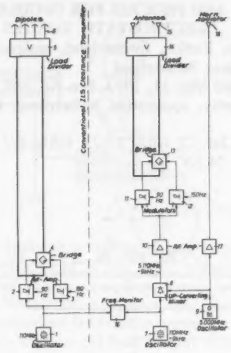
Günter Hofgen, and Werner Poschadel, both of Kornwestheim, Germany, assignors to International Standard Electric Corp., New York, N.Y.

Filed Jan. 23, 1974, Ser. No. 435,654
Int. Cl. G01s *1/16*
U.S. Cl. 343—108 R **3 Claims**

1. An instrument landing system of the two-carrier type including ground based localizer and glide-slope signal transmitting means, each generating a clearance radiation pattern and a course radiation pattern, the carrier frequencies for said

localizer and glide-slope clearance patterns being in the VHF and UHF regions, respectively; said system including an airborne receiver for determining deviations from a desired landing path by comparison of relative amplitudes of **90Hz** and **150Hz** modulation on a carrier, comprising the combination of:

ground means for generating and radiating a course radiation pattern for at least one of said localizer and glide-slope functions in the microwave frequency region;



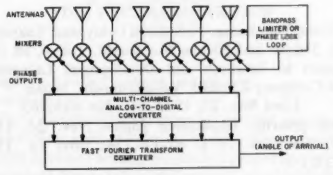
and airborne means including a microwave receiving antenna and a converter responsive thereto for converting said microwave radiation into the frequency domain of the corresponding clearance channel, and also including means for mixing said converted microwave radiation with corresponding lower carrier frequency received clearance radiation, thereby to provide for a capture effect such that said airborne means will automatically respond to ground radiations with or without said microwave radiation.

3,887,923

RADIO-FREQUENCY HOLOGRAPHY

Charles E. Hendrix, Pacific Palisades, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 26, 1973, Ser. No. 372,431
Int. Cl. G01s *7/04, 5/02*
U.S. Cl. 343—113 R **1 Claim**



1. Passive radio direction finder for producing a radio frequency hologram and numerically reconstructing the hologram said finder comprising;

a plurality of fixed antenna elements closely spaced to form a linear array having a predetermined receiving aperture for individually sampling the phase of an incoming wave front at discrete points across the receiving aperture;

a plurality of mixer elements each separately electrically coupled to each of said antenna elements for receiving individual electrical signals;

self contained reference signal means electrically coupled to receive a signal from one of said antenna elements and electrically coupled to each of said mixer elements for providing a signal output that is the same frequency as the signal received by each of said antenna elements;

a multi-channel analog-to-digital converter electrically coupled to each of said mixer elements for receiving direct current signal voltages from said mixer elements that are proportional to the relative phase of an incoming wave front as it impinges each of said antenna elements and to provide an output that is a digital representative of each direct current voltage; and

a fast Fourier transform digital computer coupled to said converter for transforming each signal received by each of said antenna elements into a signal representative of the angles of arrival as an incoming wave front impinges said antenna elements;

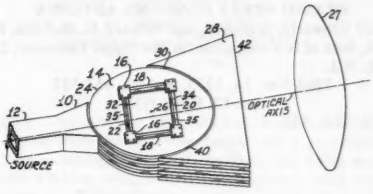
whereby a radio-frequency hologram is constructed that is indicative of the direction of the target from said direction-finder.

3,887,924

SCANNING ANTENNA

William C. Wilkinson, Jr., Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 30, 1950, Ser. No. 171,448
Int. Cl. H01q *19/06*
U.S. Cl. 343—754 **10 Claims**



8. The combination of a lens system having an optical axis and a field of focus, an antenna for the radiation or reception of energy, a dielectric block between said lens and said antenna having opposed parallel plane surfaces and rotatable about an axis normal to said optical axis and parallel to said surfaces, the index of refraction of said block with respect to the surrounding medium having a value to bring the apparent position of said antenna as a source viewed from said lens system substantially into coincidence with said field, as said block rotates.

3,887,925

LINEARLY POLARIZED PHASED ANTENNA ARRAY

Joseph C. Ranghelli, Brooklyn, N.Y., and Emmanuel J. Perrotti, Ramsey, N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed July 31, 1973, Ser. No. 384,188
Int. Cl. H01q *9/28*
U.S. Cl. 343—795 **27 Claims**

1. An antenna array comprising:

N linearly polarized mat-strip center fed dipole elements indicidually disposed on opposite sides of a printed circuit board, each of said N elements having a given orientation;

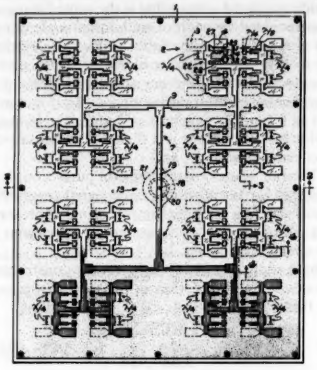
a ground plane superimposed relative to and associated with said N elements;

a mat-strip power distribution network disposed on said board coupled to said N elements;

said N elements, said ground plane and said distribution network cooperating to produce a linearly polarized antenna beam; and

a mat-strip phase shifting arrangement selectively coupled

to said distribution network to control said antenna beam to have different selected angular directions, identical



portions of said phase shifting arrangement being carried on both surfaces of said board.

3,887,926

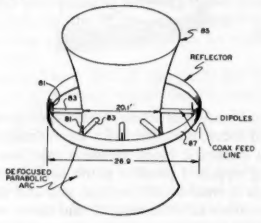
PHASED ARRAY SCANNING ANTENNA

Leonard Schwartz, Scarsdale, and Edward G. H. Chin, Rego Park, both of N.Y., assignors to The Singer Company, Little Falls, N.J.

Filed Nov. 14, 1973, Ser. No. 415,523

Int. Cl. H01q *3/26*

U.S. Cl. 343—816 **7 Claims**



1. A microwave landing system scanning beam antenna which provides a planar fan beam comprising:

a. a set of equally spaced radiating elements arranged to form one of a portion of a circle and a portion of a cylinder;

b. a source of microwave energy;

c. a plurality of phase shifters each coupling said source to one of said plurality of radiating elements;

d. a plurality of digital amplitude controllers one being interposed between the source and each phase shifter;

e. means to store digital data comprising:

1. a plurality of representations of radial lines equally spaced each representing an angular deviation from radial line through the center of an arc formed by said set of radiating elements, said plurality of representations dividing the angle equivalent to the spacing between two of said radiating elements into a plurality of small increments;

2. a digital representation of the phase shift required for each of said phase shifters to present a uniform phase front perpendicular to each of said radial lines; and

3. a digital representation of the amplitude of each of said radial lines; and

f. means to sequentially provide as outputs to said phase shifters digital representations of phase shift associated with each of said radial lines, and to sequentially provide as outputs to said digital amplitude controllers and digital representation of amplitude associated with said radial lines, whereby the antenna beam will be scanned in small increments through an angle between two elements with minimum side lobes in the radiated beam.

3,887,927

APPARATUS AND PROCESS FOR PRODUCING LATENT ELECTROSTATIC IMAGES

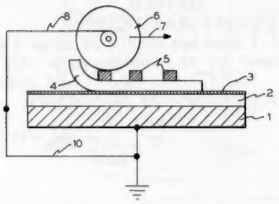
Garbor Forgo, Zurich, Switzerland, assignor to Turlabor, A.G., Zumikon, Switzerland

Filed May 11, 1973, Ser. No. 359,593

Claims priority, application Switzerland, May 23, 1972, 007588/72

Int. Cl. G03g *13/22*; **G01d** *6/11*

U.S. Cl. 346—74 ES **35 Claims**



1. A one-step process for producing in the absence of intermediate masters a latent electrostatic charge image corresponding to selected areas on one of two surfaces of an uncoated original document having non-electrostatically produced indicia on said one surface thereof, said selected areas on said document being more conductive than other areas, comprising the steps of positioning a dielectric carrier member in contact with the other of the two surfaces of said original document, providing an electrically conductive element on the free surface of said carrier member, applying an electric field potential above at least 200 volts between the free surface of said original document and said conductive element, thereafter removing said field potential and separating said original document and said carrier member whereby a latent electrostatic image is retained on said carrier member.

3,887,928

INK JET RECORDING UNIT

Genji Ohno, Yokohama; Tadamitsu Uchiyama, Tokyo; Seisaku Ohki, Tokyo, and Hishao Morohashi, Tokyo, all of Japan, assignors to Research and Development Laboratories of Ohno Company Limited, Yokohama-shi, Japan

Filed Nov. 23, 1973, Ser. No. 418,283

Claims priority, application Japan, Nov. 24, 1972, 47-117737; Nov. 24, 1972, 47-117738; Nov. 24, 1972, 47-135075[U]

Int. Cl. G01d *15/18*

U.S. Cl. 346—140 **18 Claims**

1. A recording unit comprising:

a. a hollow nozzle having an open end defining a tip for directing a jet of liquid imaging material from said nozzle;

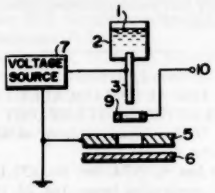
b. means for supplying a liquid imaging material to said nozzle;

c. an electrode plate having a through hole and disposed opposite to said nozzle with said through hole being coaxial with said nozzle;

d. means for disposing a recording member adjacent said electric plate on the opposite side from said nozzle;

e. a ring having an inner diameter greater than the outer diameter of said nozzle disposed in close proximity to said nozzle tip and in coaxial relationship therewith;

f. means for applying a voltage between said nozzle and electrode plate to create a first electric field therebetween having a high intensity, non-uniform component in the vicinity of said nozzle tip to form the liquid imaging material in said nozzle into a jet and to direct said jet through said through hole of said electrode plate to said recording member; and



g. means for applying a voltage to said ring to generate a second electric field of the same polarity as the high intensity component of said first electric field in the vicinity of said nozzle tip to reduce the level of said high intensity component field and to impart uniformity to said high intensity component field thereby raising the voltage level at which jetting of said liquid imaging material from said nozzle tip occurs to interrupt said jet for recording an image on said recording member.

3,887,929

SINGLE LENS REFLEX CAMERA LIGHT MEASURING SYSTEM

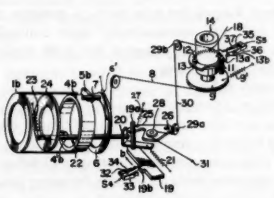
Toshinori Imura, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 27, 1973, Ser. No. 345,353

Claims priority, application Japan, Mar. 31, 1972, 47-31634

Int. Cl. G03b *7/20*

U.S. Cl. 354—46 **9 Claims**



1. A single lens reflex camera comprising:

a camera body;

an objective lens detachably mounted on said camera body, and including a diaphragm aperture means, a manually operable aperture setting means and diaphragm adjusting means adaptable to follow the movement of said aperture setting means;

light measuring means for measuring field light rays passed through said objective lens;

first changing means movable between a first position for maintaining said diaphragm aperture means fully opened and a second position for setting said diaphragm adjusting means to the preset value of said aperture setting means, said first changing means being biased in said first position;

first interlocking means movable with the operation of said aperture setting means;

second interlocking means for interlocking with said first interlocking means and for transmitting the setting of said aperture setting means to said light measuring means;

second changing means movable between a first position for enabling said second interlocking means to follow said first interlocking means and a second position for releasing said second interlocking means from following said first interlocking means, said second changing means being biased into said first position; and

manually operable means to move said first changing means and said second changing means from said first to said second position.

3,887,930

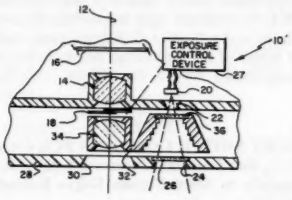
LIGHT COMPENSATION FOR EXPOSURE CONTROL CAMERAS

Richard J. Bresson, Hamlin, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 12, 1974, Ser. No. 488,613

Int. Cl. G01j *1/22*

U.S. Cl. 354—59 **6 Claims**



1. In a camera having a primary lens; a converter lens having a predetermined light loss factor and a predetermined color contribution factor, said converter lens being movable between a taking position in optical alignment with said primary lens and a stored position out of optical alignment with said primary lens; and a photocell which is part of an exposure control device; the improvement comprising:

optical means having a light loss factor of approximately one-half that of said converter lens and a color contribution factor substantially the same as that of said converter lens;

means for mounting said optical means for movement between a first position affecting light directed toward said primary lens and a second position affecting light directed toward said photocell; and

means for moving said optical means to its first position when said converter lens is in its stored position and for moving said optical means to its second position when said converter lens is in its taking position.

3,887,931

PARALLAX FREE VIEWER

James G. Baker, Winchester, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 16, 1973, Ser. No. 406,893

Int. Cl. G03b *13/08*

U.S. Cl. 354—155 **17 Claims**

1. A reflex camera comprising:

an objective lens for forming a real image of a subject;

a film plane;

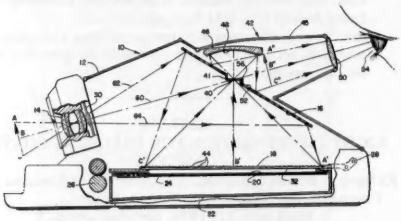
a reflective focusing screen;

means for positioning said reflective forcusing screen proximate said film plane;

a first plane mirror for reflecting said real image onto said reflective focusing screen;

a window, opposite the geometric center of said reflective focusing screen, in said first plane mirror for transmitting light reflected from said reflective focusing screen;

said reflective focusing screen having a plurality of reflective circular echelons situate on said reflective focusing screen and concentric with said geometric center, configured for forming an image of said objective lens's exit pupil at said window, said echelons having an optic axis normal to said reflective focusing screen and passing through its geometric center; and



means, including a concave mirror, situate on the side of said first plane mirror opposite said reflective focusing screen to receive said light transmitted through said window from said reflective focusing screen, for forming an aerial image of the real image focused on said reflective focusing screen.

3,887,932

MEMORY SWITCH CONTROLS FOR CAMERAS

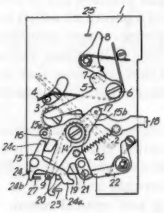
Naoyuki Uno, and Katsuhiko Nomura, both of Kawagoe, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Sept. 19, 1973, Ser. No. 398,806

Claims priority, application Japan, Sept. 21, 1972, 47-108966

Int. Cl. G03b *19/12*

U.S. Cl. 354—156 **10 Claims**



1. In a single lens reflex camera which measures light internally and which has a swingable mirror normally occupying a lower viewing position where said mirror reflects light which has travelled through the objective to a light-measuring structure and being swingable from said lower position to an upper exposure position where light travelling through the objective no longer reaches the light-measuring structure, memory switch means movable between a normal inactive position and an operative position enabling a memory structure to retain information received by the light-measuring structure, said memory switch means having an inherent force which acts to maintain said memory switch means in said inactive position, mirror-drive means cooperating with the mirror to drive the latter upwardly from said lower viewing position to said upper exposure position, switch-operating means cooperating with said memory switch means for displacing the latter in opposition to said inherent force from said normal inactive position to said operative position, said switch-operating means having a rest position cooperating with said mirror-drive means to prevent operation thereof, said switch-operating means being movable from said rest position thereof for placing said memory switch means in said operative position thereof, while said switch-operating means also releases said mirror-drive means for operation to drive said mirror to said exposure position thereof, and manually operable release means to be set into motion by the operator of the camera for carrying out operations in connection with shutter release, said manually operable release means cooperating with said switch-operating means for moving the latter to place said memory switch means in said operative position thereof, whereby said mirror-drive means will not be released to drive the mirror upwardly to its exposure position until after said memory switch means has been placed by said switchoperating means in said operative position thereof.

3,887,933

LENS BARREL FOR AUTOMATICALLY CONTROLLED ELECTRONIC FLASH UNIT

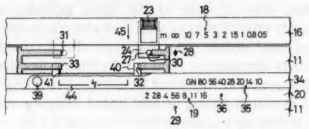
Kenichi Miyake, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

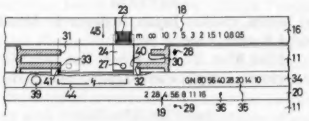
Filed Jan. 9, 1974, Ser. No. 432,123

Claims priority, application Japan, Jan. 23, 1973, 48-11022

Int. Cl. G03b *3/00*

U.S. Cl. 354—195 **5 Claims**





1. A lens barrel for use with a camera adapted to be mounted with an automatically light controlled electronic flash unit and further adapted for both ordinary and flash photography, comprising:

a stationary tube;

a diaphragm aperture setting ring rotatably provided on said stationary tube and having a calibrated diaphragm scale; a lens focussing ring rotatably provided on said stationary tube about an axis and bearing a distance scale thereon and rotatable from an infinity focusing position to a closest focusing position through an angle corresponding to the angle of rotation of said diaphragm aperture setting ring;

a changing member movable with said focussing ring in the direction of its rotation and movable in the axial direction of said focussing ring from a first position for ordinary photography to a second position for flash photography; a pair of first limiting elements on said stationary tube and engageable with said changing member for limiting the range of rotation of said focussing ring between the infinity focusing position and the closest focussing position when said changing member is at said first position;

a pair of second limiting elements on said stationary tube and engageable with said changing member for limiting the range of rotation of said focussing ring between a maximum focussing position for flash photography and the closest focussing position when said changing member is moved from said first position to said second position;

a guide number ring having a guide number scale and being rotatably provided on said stationary tube and retainable at desired set positions indicated by the number scale; and

a third limiting element on said guide number ring and engageable with said changing member for limiting the range of rotation of said focussing ring in one direction to a position determined by the set position of the guide number ring.

3,887,934

PHOTOGRAPHIC SHUTTER

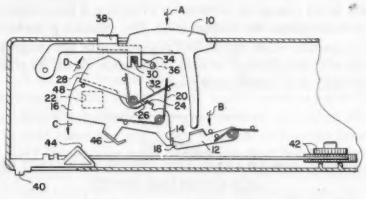
Helmut Ettischer, Ruit, Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 16, 1974, Ser. No. 433,627

Claims priority, application Germany, Feb. 8, 1973, 2306056

Int. Cl. G03b *9/14*

U.S. Cl. 354—251 **4 Claims**



1. In a camera having an exposure aperture, a shutter mechanism comprising:

an opening blade movable relative to the exposure aperture between a closed position wherein said opening blade covers the aperture and an open position wherein said opening blade uncovers the exposure aperture;

a first spring coupled with said opening blade urging said opening blade toward its open position;

a closing blade movable relative to the exposure aperture between an open position wherein said closing blade uncovers the exposure aperture and a closed position wherein said closing blade covers the exposure aperture, a portion of said closing blade defining an impact receiving member;

means responsive to movement of said opening blade from its closed position toward its open position for striking said impact receiving member of said closing blade to effect movement of said closing blade in a first direction away from its closed position; and

a second spring coupled with said closing blade for urging said closing blade in a second direction toward its closed position, said second spring being weaker than said first spring.

3,887,935

INTEGRATED SEMICONDUCTOR ARRANGEMENT INCLUDING SOLAR CELL AND A SCHOTTKY DIODE

Horst Fischer, Heilbronn, and Willi Pschunder, Flein, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

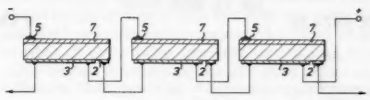
Filed Nov. 2, 1973, Ser. No. 412,105

Claims priority, application Germany, Nov. 3, 1972, 2253831

Int. Cl. H01l *11/00, 15/00*

U.S. Cl. 357—15 **10 Claims**

1. An integrated semiconductor arrangement comprising in combination: a solar cell including a semiconductor body of a first conductivity type having a region of the opposite conductivity type adjacent one major surface thereof and forming the pn-junction of the solar cell, an ohmic front side contact for said region of opposite conductivity type and an ohmic rear side contact covering substantially the entire rear surface of said semiconductor body; and a metal coating on said rear surface of said semiconductor body and forming a rectifying



metal semiconductor contact with said semiconductor body, said metal coating having at least one narrow strip-shaped portion which is substantially surrounded by but separated from said ohmic rear side contact of said solar cell.

3,887,936

RADIATION SENSITIVE SOLID STATE DEVICES

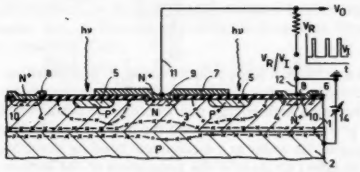
John Martin Shannon, and John Ernest Ralph, both of Salfords, near Redhill, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 18, 1973, Ser. No. 398,491

Claims priority, application United Kingdom, Sept. 22, 1972, 43956/72

Int. Cl. H01l *17/00*

U.S. Cl. 357—30 **26 Claims**

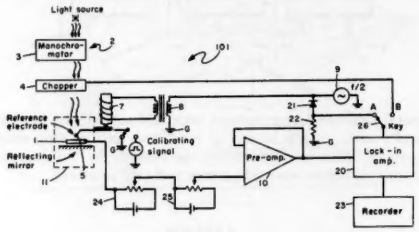


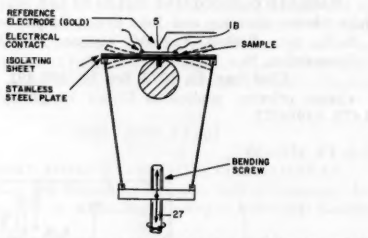
1. A radiation sensitive solid state device comprising a semiconductor body having a semiconductor layer of one conductivity type, at least one radiation sensitive element being present in the semiconductor layer and comprising a junction field effect transistor structure, said junction field effect transistor structure comprising source and drain connections at positions spaced apart laterally of the semiconductor layer whereby in the layer portion situated intermediate said connections a substantially lateral flow of charge carriers characteristic of said one conductivity type can occur in a channel region, at least one of said source and drain connections being present at a first surface of the semiconductor layer, a gate electrode situated at or adjacent said first surface in the proximity of the channel region and forming a rectifying junction with the semiconductor layer material of the one conductivity type whereby said lateral current flow in the channel region is determined in accordance with the extent of a depletion region associated with and extending into the layer from said rectifying junction, said gate electrode being connected via a storage capacitor present at or adjacent to said first surface to the said one of the source and drain connections, a first terminal connection forming a common connection to said one of the source and drain connections and to the side of the capacitor remote from the gate electrode, and a second terminal connection to the other of said source and drain connections, means being present to permit incident radiation to be absorbed in the semiconductor layer in the vicinity of the channel region for generation of free charge carriers in order to influence the extent of a depletion region associated with the gate electrode rectifying junction.

3,887,937
SEMICONDUCTOR SENSOR

Harry C. Gatos, Weston, Mass., and Jacek Lagowski, Warsaw, Poland, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sept. 21, 1972, Ser. No. 290,666
Int. Cl. H01l *15/00*
U.S. Cl. 357—26 **6 Claims**



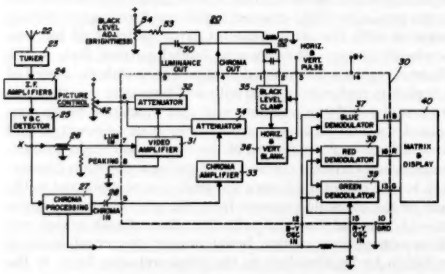


1. A mechanical force sensor having, in combination, a thin non-centrosymmetric semiconductor wafer comprising a material having a high energy gap wherein the surface states are not in good communication with the bulk; means for applying the force to the wafer as a mechanical bending stress upon the wafer to effect changes in the population of the surface states of the semiconductor to effect changes in the surface barrier without appreciably affecting the electrical carrier concentration in the bulk material; and means for detecting the changes in the surface states as a consequence of said changes in population and for relating the same to the force to-be-sensed.

3,887,938
IC COLOR DEMODULATOR WITH SINGLE EXTERNAL PICTURE CONTROL

Gildo Cecchin, Niles, Ill., assignor to Motorola, Inc., Chicago, Ill.

Filed Mar. 18, 1974, Ser. No. 452,240
Int. Cl. H04n *9/535*
U.S. Cl. 358—27 **15 Claims**



9. In a color television receiver having a source of composite video signal information and also a source of chroma signal information, an improved color demodulator arrangement, including in combination:

a plurality of demodulators for deriving respective color signals;

first amplifiers means for amplifying the composite video signal and applying the same to first attenuator means for controlling the level of luminance signal as translated thereby;

second amplifier means for amplifying the chroma signal and applying the same to second attenuator means for controlling the level of chrominance signal as translated thereby;

manually adjustable resistance means for connection to said first and second attenuators in common so as to selectively and simultaneously control the level of luminance and chrominance signals as translated thereby;

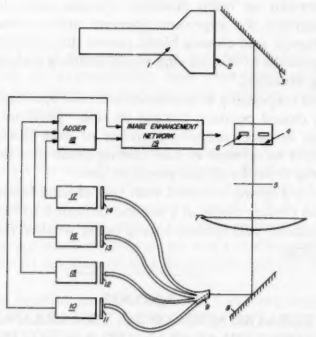
light dependent resistance means for connection to said first and second attenuators in common so as to control automatically the luminance and chrominance signal levels as translated thereby in accordance with and in response to ambient light level; and

black level clamping means for effecting a fixed bias to said demodulators in response to the blanking level of the composite video signal and regardless of the magnitude of the d-c component in said luminance signal as translated by said first attenuator means.

3,887,939
SCANNING APPARATUS AND METHOD USING SHARP AND UNSHARP SPOTS

Robert W. G. Hunt, North Harrow, England, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 23, 1973, Ser. No. 353,834
Claims priority, application United Kingdom, Apr. 27, 1972, 19691/72
Int. Cl. H04n *3/28, 9/08*
U.S. Cl. 358—75 **9 Claims**



1. Apparatus for producing electrical signals corresponding to information from a color object, said apparatus comprising:

a. means for scanning a color object with two spots of light, the first of said spots being small and sharp, and the second of said spots being large and unsharp,

b. first means utilizing substantially all of and only the light passing from the first spot scan of such object, for producing a high definition luminance signal, and

c. second means, utilizing substantially all of the light passing from the second spot scan of such object, for producing low definition color signals.

3,887,940
LIQUID FABRIC WALL COVER

Donald J. Mangold, Moraga, and John E. Vetterli, Albany, both of Calif., assignors to The Flecto Company, Inc., Oakland, Calif.

Continuation of Ser. No. 172,353, Aug. 12, 1971, abandoned. This application May 10, 1973, Ser. No. 359,043
Int. Cl. C08d *7/08;* **C08f** *45/16*
U.S. Cl. 260—8 **9 Claims**

1. A composition for application to a surface with a roller to produce a fabric-like surface coating, said composition consisting essentially of the following components blended together in relative amounts effective to permit substantially even spreading thereof over the surface by a hand-operated paint roller, relative amounts of said components being selected from the following relative proportions:

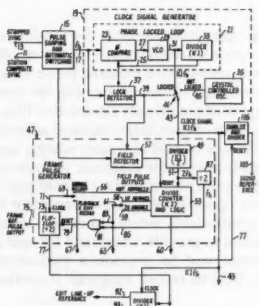
Fibrous Textile Mass	1–2 lbs. having a volume of .075–0.24 cubic feet, said thickening
Water	agent being 5–20% by weight thereof
Soluble or Swellable Thickening Agent	
Latex Adhesive	50–400 grams (100% solids basis)
Water	3.7–4.7 quarts

wherein the majority of the fibers in said textile mass are about 1–3 mm. in length and have a flocculent appearance, and a minority of the fibers in said textile mass are one-fourth to three-fourths inches in length, further provided that all fibers in said mass are not more than three-fourths inches in length, said thickening agent being selected from water soluble, hydrophilic, colloidal cellulose and natural gums, albumin and colloidal silica and said latex adhesive being selected from styrene-butadiene, polystyrene, polyvinyl chloride, polyvinylidene chloride, polyvinyl alcohol, polyvinyl urethane, copolymers of methylmethacrylate and ethylmethacrylate latexes.

3,887,941
SYNCHRONIZING PULSE PROCESSOR FOR A VIDEO TAPE RECORDER

Bert H. Dann, Mountain View, and Nikola Vidovic, Sunnyvale, both of Calif., assignors to International Video Corporation, Sunnyvale, Calif.

Filed Sept. 1, 1972, Ser. No. 285,919
Int. Cl. H04l *7/00;* **H04n** *5/04*
U.S. Cl. 360—36 **18 Claims**



1. A synchronizing pulse processor for a video tape recorder wherein synchronizing pulses at the television field rate, frame rate and horizontal line rate are processed, said synchronizing pulse processor normally receiving reference horizontal pulses and reference field pulses normally related to said reference horizontal pulses, the combination comprising

means receiving said reference horizontal pulses for generating clock pulses having a frequency at a multiple of the reference horizontal pulse frequency,

means receiving said reference field pulses and said clock pulses for generating at least two field rate pulse outputs, said field rate pulse outputs spaced in time by an integral number of clock pulse intervals, one of said field rate pulse outputs synchronized to said clock pulses and said reference field pulses as a reference synchronous field output, the other of said field rate pulse outputs occurring before said reference field pulses as an advanced field pulse output,

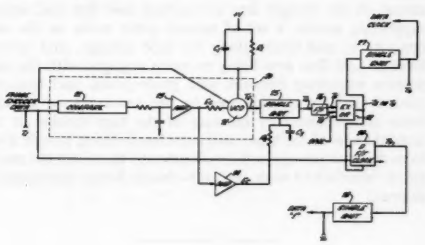
stable self-contained oscillator means for generating said clock pulses, and

means for detecting the presence of said reference horizontal pulses to apply the multiple of said reference horizontal pulses as said clock pulses when said reference horizontal pulses are present and for simultaneously applying the pulses from said oscillator as said clock pulses to said field rate pulse generating means and removing said reference field pulses from said means for generating field rate pulses when said reference horizontal pulses are absent, whereby the change of clock pulse sources has substantially no effect on the substantially lower frequency field pulse rate.

3,887,942
TAPE SPEED COMPENSATION SYSTEM

Noah Horowitz, Los Angeles, Calif., assignor to Century Data Systems, Inc., A Division of California Computer Products, Inc., Anaheim, Calif.

Filed Apr. 13, 1972, Ser. No. 243,625
Int. Cl. G11b *5/09*
U.S. Cl. 360—51 **5 Claims**



1. An apparatus for compensating for variations in the speed of a moving medium upon which digital data is recorded comprising:

means for varying the time position of the opening of a sample window as a function of the recording medium variations comprising a phased locked oscillator which generates a feedback voltage proportional to the instantaneous phase difference between the input frequency and the phase locked oscilator frequency;

means for varying the time position of the closing of the sample window as a function of recording medium speed variations comprising a one shot multivibrator having a width which is controlled by the feedback voltage generated by said phase locked oscillator;

means for centering the time position of the data edge between said opening and closing of the sample window and

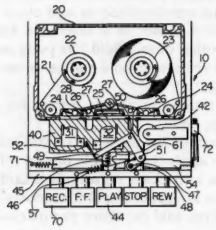
means for adjusting the opening and closing of the sample window so as to maintain the data edge centered with, respect to the opening and closing of the sample window as the speed of the recording medium varies.

3,887,943

AUTOMATIC STOP APPARATUS FOR TAPE RECORDER

Hiromasa Katsurayama, Nagoya, Japan, assignor to Shin-Shirasuna Electric Corporation, Nagoya-shi, Japan

Filed Mar. 22, 1973, Ser. No. 343,662
Int. Cl. G11b *23/04, 15/43, 15/00*
U.S. Cl. 360—96 6 Claims



1. A tape recorder and automatic stop means which comprises in combination a set of reels to which tape ends are secured and between which tape is driven, a sub-chassie having heads disposed to move toward tape passage and away from tape passage, the sub-chassie being spring biased away from tape passage, a first L-shaped arm having a first supporting point on the sub-chassie at the arm joinder and a sensing lever provided at an end thereof, a second arm having a second supporting point at a fixed position on a frame and pivotally connected to said first arm at an end opposite the sensing lever, means for locking the position of the sub-classis when said sub-chassis is moved so that said head is urged against the tape and the connecting point of said first and second arms comes on the straight line connecting said first and second supporting points, a set of spaced guide posts on the side opposite to said heads along the tape passage, said sensing lever of said first arm being pressure engaged with the tape portion stretching between said guide posts, said first and second arms being displaced by the sensing lever pushing force accompanied by increase of the tape tension at the terminal end of the tape, said sub-chassis being moved away from the tape passage and simultaneously therewith the mechanism interlocked with said sub-chassis being mechanically stopped.

3,887,944

METHOD FOR ELIMINATING PART OF MAGNETIC CROSSTALK IN MAGNETORESISTIVE SENSORS

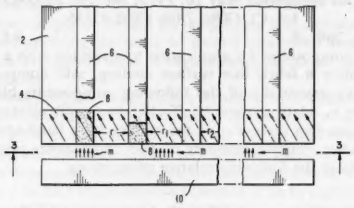
Christopher H. Bajorek, Lewisboro, and David A. Thompson, Somers, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 29, 1973, Ser. No. 375,286
Int. Cl. G11b *5/12*
U.S. Cl. 360—113 16 Claims

1. An integrated array of magnetic recording elements comprising a substrate,

a thin film of magnetoresistive material on said substrate,

a plurality of spaced electrical conductors each of which overlaps a separate region of said magnetoresistive material, and



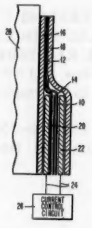
a high coercivity material interposed between said magnetoresistive material and its corresponding overlapped conductors.

3,887,945

HEAD ASSEMBLY FOR RECORDING AND READING, EMPLOYING INDUCTIVE AND MAGNETORESISTIVE ELEMENTS

Daniel A. Nepela, Saratoga, and Robert I. Potter, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 12, 1973, Ser. No. 424,242
Int. Cl. G11b *5/30, 5/12*
U.S. Cl. 360—113 13 Claims



10. A multilayer head assembly for reading and recording magnetically recorded information on a medium comprising:

a layer of a magnetoresistive material for sensing magnetically recorded information while transversing the medium,

a pair of layers of electrically conductive film material, one planar surface of each layer disposed adjacent to opposite planar surfaces of said magnetoresistive layer; and

a pair of highly permeable magnetic members, one disposed adjacent to each planar surface of said pair of conductive film layers opposite said magnetoresistive layer;

selectively controllable means connected to said conductive film material to provide a bias field for said magnetoresistive element and to provide a periodically reversible magnetic field to record magnetic transitions in the medium.

DESIGN PATENTS

GRANTED JUNE 3, 1975

ERRATA

For CLASS	See PATENT NO.
023–090.1	235,273

Alfred J
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359,007.
Ser. No.

U.S. Cl. D

Leif Blo
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DESIGNS

JUNE 3, 1975

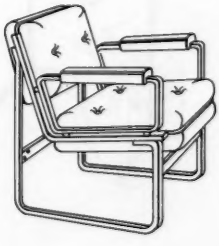
235,233
CHAIR
Alfred J. Prizlow, Bloomfield Hills, Mich., assignor to GF Business Equipment, Inc., Youngstown, Ohio
Filed Aug. 25, 1971, Ser. No. 175,033
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—30

235,234
OTTOMAN
Jerry Johnson, Rancho Cuerdo, Box 50, Portrero, Calif. 92063
Original design application May 10, 1973, Ser. No. 359,007. Divided and this application July 17, 1974, Ser. No. 489,079
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—36

235,235
LOUNGE CHAIR
Leif Blodee, Holland, Mich., assignor to American Seating Company, Grand Rapids, Mich.
Filed June 22, 1973, Ser. No. 372,854
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—38

235,236
CHAIR
Alfred J. Prizlow, Bloomfield Hills, Mich., assignor to GF Business Equipment, Inc., Youngstown, Ohio
Filed Aug. 25, 1971, Ser. No. 175,032
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—66

235,237
LOUNGE CHAIR WITH LOW BACK
Leif Blodee, Holland, Mich., assignor to American Seating Company, Grand Rapids, Mich.
Filed June 22, 1973, Ser. No. 372,808
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—67

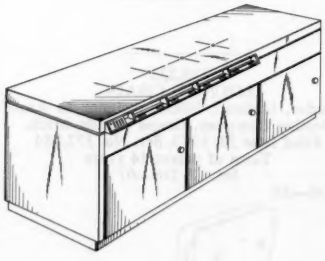


235,238
DISPLAY STAND OR SIMILAR ARTICLE
Melvin Braverman, Glen Cove, N.Y., assignor to A&M Leatherlines, Inc., New York, N.Y.
Filed June 25, 1973, Ser. No. 373,571
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—85

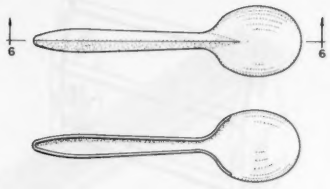
235,239
CLOTHES DRYING RACK
Earl H. Cartwright, 967 N. Iowa, Olathe, Kans. 66061
Filed Sept. 4, 1973, Ser. No. 393,735
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—181

235,240
PICTURE FRAME
Wayne K. Bessinger, Rte. 1, Box 198, Bourbon, Ind. 46504
Filed May 25, 1973, Ser. No. 363,864
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—239

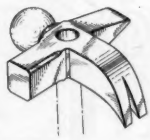
235,241
ELECTRIC COUNTER TOP COOKING RANGE
Philip H. Peters, Jr., Washington County, and John L. Matrone, Albany County, N.Y., assignors to Environment/One Corporation, Schenectady, N.Y.
Filed Sept. 23, 1971, Ser. No. 183,288
Term of patent 14 years
Int. Cls. D7—*02*; D6—*04*
U.S. Cl. D7—111



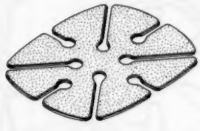
235,242
SOUP SPOON
William A. Dart, and Laurence T. Uridge, Mason, Mich., assignors to Dart Container Corporation, Mason, Mich.
Filed June 21, 1973, Ser. No. 372,080
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—138



235,243
HAMMERHEAD
Josef Pecenka, Pretoria, Hotel Fiesta, 580 Church St., Transvaal, Republic of South Africa
Filed Nov. 13, 1973, Ser. No. 415,373
Claims priority, application Republic of South Africa June 26, 1973
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—79

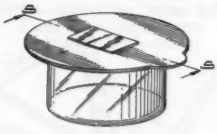


235,244
ABRASIVE PAD FOR GRINDING LENSES
Waldemar Stoppacher, White Plains, N.Y., assignor to Interoptic Laboratories, Inc., Elmsford, N.Y.
Filed Dec. 10, 1973, Ser. No. 423,174
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—90

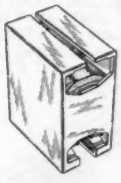


235,245
BOTTLE OR SIMILAR ARTICLE
John Wesley McDonald, Kansas City, Mo., assignor to Ethyl Development Corporation, Kansas City, Mo.
Filed June 20, 1973, Ser. No. 371,865
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—143

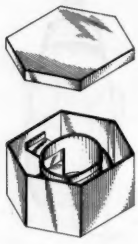
235,246
PACKAGING CONTAINER
David E. Evans, Jr., Bexley, and James W. Murray, Columbus, Ohio, assignors to The Columbus Dental Manufacturing Company, Columbus, Ohio
Filed Mar. 21, 1973, Ser. No. 343,449
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—222



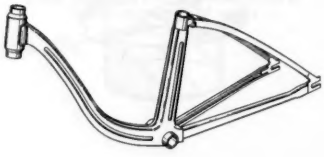
235,247
RAZOR BLADE DISPENSER
Paul A. Braginetz, Staunton, Va., assignor to Philip Morris Incorporated, New York, N.Y.
Filed May 8, 1973, Ser. No. 358,405
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D9—224



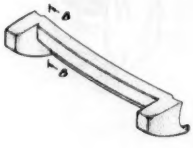
235,248
HAT BOX
David Bennett, Rockville Centre, N.Y., assignor to The Modern Box Corporation, Brooklyn, N.Y.
Filed June 4, 1973, Ser. No. 366,626
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—240



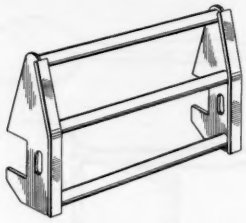
235,249
BICYCLE FRAME
Kaname Kitsuda, 115 Shinshuku, Hiratsuka-shi, Kanagawa-ken, Japan
Filed Apr. 9, 1974, Ser. No. 459,352
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—111



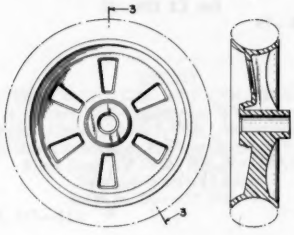
235,250
VEHICLE BUMPER PANEL
Alan J. Mittelman, 5160 Venice Blvd., Los Angeles, Calif. 90019, and Wilbert H. Phillips, 7520 Valjean St., Van Nuys, Calif. 91406
Filed Apr. 23, 1974, Ser. No. 463,298
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—169



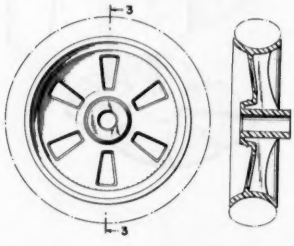
235,251
VEHICLE GRILLE GUARD
Dennis Gary Asbury, Spring Valley, Calif., assignor to House of Steel, Spring Valley, Calif.
Filed Feb. 22, 1974, Ser. No. 444,737
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—169



235,252
WHEEL CENTER
Joseph R. May, Chatham, and Donald F. Morgan, Bloomingdale, N.J., assignors to Amerace Corporation, New York, N.Y.
Filed Feb. 14, 1974, Ser. No. 442,660
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211

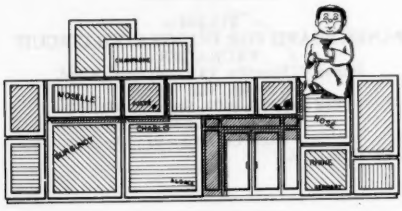


235,253
WHEEL CENTER
Joseph R. May, Chatham, and Donald F. Morgan, Bloomingdale, N.J., assignors to Amerace Corporation, New York, N.Y.
Filed Feb. 14, 1974, Ser. No. 442,661
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211

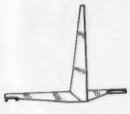


235,254
TILE SHAKE
Merle A. Luther, P.O. Box 347, Cascade, Idaho 83611
Filed June 23, 1972, Ser. No. 265,858
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1 J

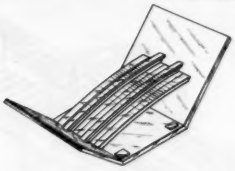
235,255
BUILDING
Francis H. Neverett, Landing Road, Chazy, N.Y. 12921
Filed Nov. 12, 1973, Ser. No. 414,762
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 B



235,256
SUPPORT UNIT FOR ABOVE-GROUND SWIMMING POOLS OR THE LIKE
William A. Oden, Upland, Calif., assignor to Domain Industries, Inc., New Richmond, Wis.
Filed June 21, 1973, Ser. No. 372,284
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D13—1 G



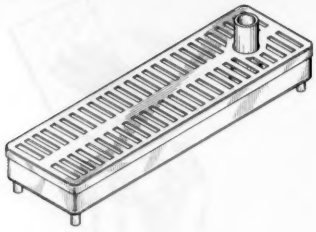
235,257
CARD FILE OR SIMILAR ARTICLE
Gordon Perry, Bayside, N.Y., assignor to Oxford Pendaflex Corporation, Garden City, N.Y.
Filed July 25, 1973, Ser. No. 382,484
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76



235,258
FISHING REEL
Tatsuo Sugimoto, Tokyo, Japan, assignor to Daiwa Seiko Incorporated, Tokyo, Japan
Filed Jan. 18, 1974, Ser. No. 434,801
Claims priority, application Japan July 27, 1973
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25

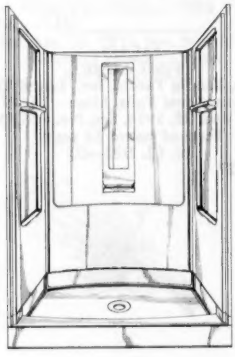
235,259
FISH LURE
Glen R. Welle, Ric-Jig Tackle, Inc., Island View Route, International Falls, Minn. 56649
Filed Jan. 25, 1974, Ser. No. 436,531
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

235,260
WATER CONDITIONER RETAINER FOR AN AQUARIUM
Eugene G. Danner, 9122 71st Road, Forest Hills, N.Y. 11375
Filed Oct. 27, 1972, Ser. No. 301,667
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3

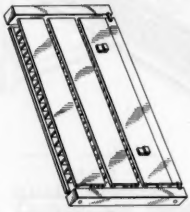


235,261
COLOR CODED NOZZLE
William J. Wichman, Glendora, and Dennis L. Hart, Hacienda Heights, Calif., assignors to Rain Bird Sprinkler Mfg. Corp., Glendora, Calif.
Filed May 1, 1972, Ser. No. 249,477
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—34

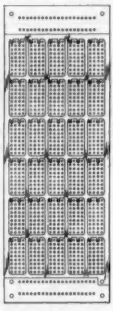
235,262
SHOWER STALL
Merritt W. Seymour, Sylvania, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Continuation-in-part of abandoned design application Ser. No. 308,357, Nov. 21, 1972. This application July 20, 1973, Ser. No. 381,194
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—57



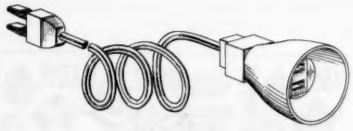
235,263
HEAT CONVECTOR
Gunnar Olaf Vestergaard Rasmussen, % Hudevad Radiatorfabrik Aktieselskab, Aarslev, Denmark
Filed June 19, 1972, Ser. No. 264,289
Claims priority, application Denmark Dec. 20, 1971
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—127



235,264
PANEL BOARD FOR INTEGRATED CIRCUIT PACKAGES
James V. Murphy, 28 Ladderlook Road, Warwick, R.I. 02886
Filed June 18, 1973, Ser. No. 371,232
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 A

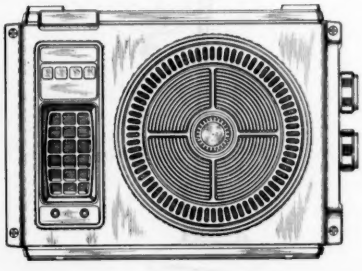


235,265
COMBINED EXTENSION CORD AND SAFETY SOCKET THEREFOR
Howard Perry Michener, 44 Plainfield Road, Stirling, N.J. 07980
Filed Mar. 21, 1972, Ser. No. 236,801
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 B

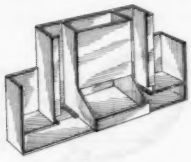


235,266
PALM SUPPORTED FINGER OPERATED SWITCH
Chester B. Rackson, 22 Orchard Drive, Woodbury, N.Y. 11797
Filed Mar. 13, 1974, Ser. No. 450,849
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 R

235,267
EIGHT-TRACK PORTABLE TAPE PLAYER
Richard Culbertson, Manlius, and Cornelius W. Christie, Jr., Fulton, N.Y., assignors to General Electric Company
Filed July 11, 1974, Ser. No. 487,567
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 B

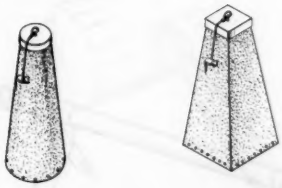


235,268
MATCH DISPENSER WITH SHELF OR SIMILAR ARTICLE
Francis R. McNine, 340 Success Ave., Bridgeport, Conn. 06604
Filed Mar. 26, 1973, Ser. No. 344,728
Term of patent 14 years
Int. Cl. D27—*99*
U.S. Cl. D27—32



235,269
TURNSTILE
Theodore Nica, New York, N.Y., assignor to Perey Manufacturing Co., Inc., New York, N.Y.
Filed July 13, 1973, Ser. No. 379,126
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D28—1 B

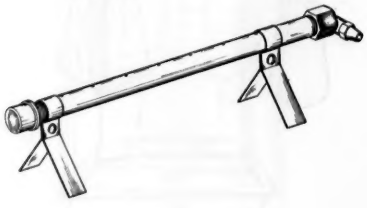
235,270
SCRATCHING POST FOR CATS
Paul A. Borak, 600 Shepley Drive, Glasgow Village, Mo. 65254
Filed June 15, 1973, Ser. No. 370,429
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—42



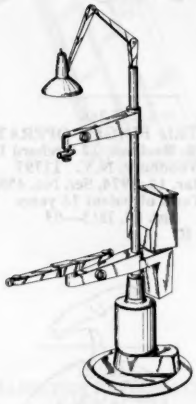
235,271
TENNIS RACKET FRAME
Mitsuji Kameoka, 1–8–24, Jingumae Shibuya-ku, Tokyo, Japan
Filed Oct. 17, 1973, Ser. No. 407,302
Claims priority, application Japan, May 31, 1973
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 ST

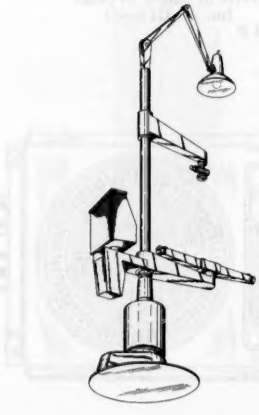
235,272
GOLF CLUB HEAD
Martin E. Quast, 8013 Washburn Circle, Bloomington, Minn. 55431
Filed April 19, 1973, Ser. No. 352,621
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

235,273
FIRE STARTER NOZZLE
Leslie G. Boyd, Dallas, Tex., assignor of fractional part interest to Daniel B. Jackson, Seymour, Tex.
Filed Aug. 21, 1973, Ser. No. 390,326
Term of patent 14 years
Int. Cl. D23—*05*
U.S. Cl. D23—90.1



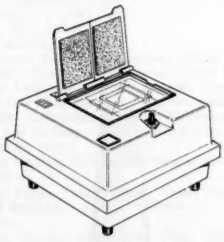
235,274
OPHTHALMIC STAND
John T. Armbruster, Niagara Falls, N.Y., assignor to American Optical Corporation, Southbridge, Mass.
Filed Feb. 23, 1973, Ser. No. 335,188
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D57—1 E



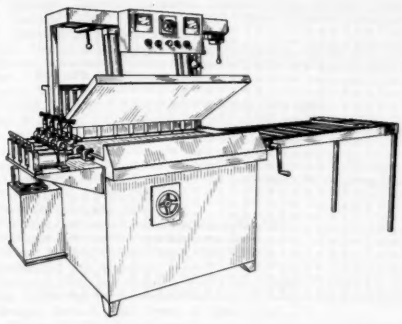


235,275
PAPER TOWELING
Bridget Austin, Green Bay, Wis., assignor to Fort Howard Paper Company, Green Bay, Wis.
Filed July 2, 1973, Ser. No. 375,907
Term of patent 14 years
Int. Cl. D5—*03*
U.S. Cl. D59—2 A

235,276
CONTACT PRINTER
Ronald Keith Dodson, Portland, and Donald H. McCauley, Beaverton, Oreg., assignors to GAF Corporation, New York, N.Y.
Filed July 23, 1973, Ser. No. 382,001
Term of patent 14 years
Int. Cl. D16—*04*
U.S. Cl. D61—1 Q

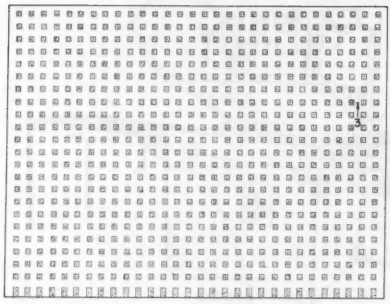


235,277
HIGH FREQUENCY PRESS FOR GLUEING SECTIONS OF WOOD TO PRODUCE PANELS, FRAMES AND OTHER TYPES OF GLUED WOOD STRUCTURES
Ernest E. Rosenquist, North Wilkesboro, N.C., assignor to L&L Machine Division, Modern Globe, Inc.
Filed Feb. 12, 1973, Ser. No. 331,958
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D63—1

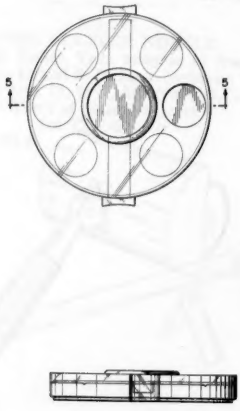


235,278
COMBINED PAINT APPLICATOR AND ROLLER THEREFOR
Robert I. Janssen, 1160 Sibley Memorial Highway, St. Paul, Minn. 55118
Filed Oct. 10, 1972, Ser. No. 296,234
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D64—18

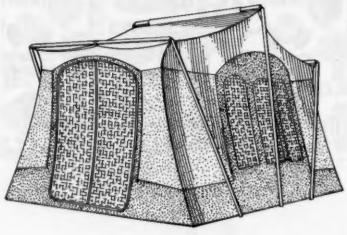
235,279
STERILIZER CONTROL INDICATOR
Seymour Schuman, and Arthur W. Kelson, New York, N.Y., assignors to Propper Manufacturing Co., Inc., Long Island City, N.Y.
Filed June 28, 1973, Ser. No. 374,358
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D83—1 W



235,280
COSMETIC CONTAINER
Henry G. Glass, Roanoke, Va., assignor to Eli Lilly and Company, Indianapolis, Ind.
Filed May 1, 1973, Ser. No. 356,272
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D86—10 N



235,281
TENT
George B. Madison, Haysville, and Eugene D. Lundblade, Larry S. Thornton, Benjamin C. Baugh, and Lauren D. Worley, Wichita, Kans., assignors to The Coleman Company, Inc., Wichita, Kans.
Filed May 24, 1973, Ser. No. 363,395
Term of patent 14 years
Int. Cl. D21—*04*
U.S. Cl. D88—3 B



235,282
YARN CONE
Charles Robert Langston, Jr., Seneca, S.C., assignor to Coats & Clark, Inc., New York, N.Y.
Filed Sept. 4, 1973, Ser. No. 393,968
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D92—15

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Demou, John G.; and Cenker, Moses, 3,887,505.
Narayan, Thirumurti L.; and Cenker, Moses, 3,887,501.

Bassan, Eraclio. Link hinge. 3,886,627, Cl. 16-163.000.

Bathelt, Robert Richard; and Schuil, Roelof Egbert, to U.S. Philips Corporation. Shadow mask having conductive layer in poor thermal contact with mask. 3,887,828, Cl. 313-402.000.

Batt, John A.: *See—*
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Battelle Memorial Institute S.A. Automobiles Citroen: *See—*
Doniat, Denis; Beccu, Klaus; and Porta, Augusto, 3,887,400.

Battershell, Robert D.; Bimber, Russell M.; and Bungs, Janis A., to Diamond Shamrock Corporation. Phosphoramidothioate esters. 3,887,657, Cl. 260-938.000.

Bauer, Hans. Device for measuring the humidity of gases. 3,886,797, Cl. 73-335.000.

Baughan, Harry O., III: *See—*
Gillman, Robert N.; Koehne, Anthony J.; and Baughan, Harry O., III, 3,887,099.

Bausier, Andre Henri, to Raffinerie Tirlemontoise. Apparatus for continuously separating and discharging heavy foreign matters from beets. 3,887,074, Cl. 209-158.000.

Baxter, Bobby G., to Binkley Company, The. System for moving and aligning modular house units onto a foundation. 3,887,083, Cl. 214-1.00H.

Baxter, Bobby G., to Binkley Company, The. Prefabricated house module moving system. 3,887,085, Cl. 214-1.00H.

Baxter Laboratories, Inc.: *See—*
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Bayer Aktiengesellschaft: *See—*
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Bayles, John; Bremer, Randall C.; Gauthier, George E.; Nascimbeni, Frank J.; and Petitjean, Robert J., to Arrow-Hart, Inc. High current switch. 3,887,888, Cl. 335-195.000.

Beatrice Foods Company: *See—*
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Beauchamp, Gerald J.; and Kelly, Thomas A., to Beaukel, Ltd. Practice hockey puck of felt material. 3,887,188, Cl. 273-128.00R.

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Bechtel International Corporation: *See—*
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Beck, Theodore A., to Hayden Trans-Cooler, Inc. Heat exchange apparatus. 3,887,004, Cl. 165-179.000.

Becker, Rudolf; and Becker, Wolfgang, to Linde Aktiengesellschaft. Container system for the storage and/or transportation of liquefied gas. 3,886,885, Cl. 114-74.00A.

Becker, Wolfgang: *See—*
Becker, Rudolf; and Becker, Wolfgang, 3,886,885.

Beckers, Norman L., to Diamond Shamrock Corporation. Methylene chloride stabilized with organic epoxides. 3,887,628, Cl. 260-652.50R.

Beckwith, Athelstan L. J., to Sherwin-Williams Company, The. Method for producing heterocyclic acid anhydrides. 3,887,550, Cl. 260-244.00R.

Beckwith, Merton M.: *See—*
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Behring, Harry L.; and Spector, George. Border frame for pictures. 3,886,677, Cl. 40-152.000.

Beiswenger, John L.; and Jorgensen, Leland DeVon, to National Presto Industries, Inc. Alarm device. 3,887,909, Cl. 340-274.000.

Bell & Howell Company: *See—*
La Rue, Mervin W., Jr., 3,887,393.

Bell, Philip Richard, to Marconi Company Limited, The. Digital-to-analogue converter for rapidly converting different codes. 3,887,911, Cl. 340-347.0DA.

Bell Telephone Laboratories, Incorporated: *See—*
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Bellettini, Arturo Gabriel; and Franklin, Richard Crawford, to du Pont de Nemours, E. I., and Company. Coupling process for substituted aminoazobenzenesulfonic acids. 3,887,540, Cl. 260-205.000.

Belousov, Alexeevich Vladimir: *See—*
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Bennett, Ronald W., to General Motors Corporation. Tractor-trailer braking system with variable motor speed control device. 3,887,238, Cl. 303-7.000.

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Bergmann, Paul F., Jr. Portable building structure. 3,886,699, Cl. 52-90.000.

Berman, Bernard H. Exercise apparatus for bedridden patients. 3,887,180, Cl. 272-58.000.

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Bernard, Michel Louis; and Coudrin, Gerard, to Republic of France. Process and apparatus for heterogeneous catalysis of a chemical reaction, particularly catalytic decomposition of hydrogen peroxide. 3,887,696, Cl. 423-579.000.

Bernardin, Leo J., to Kimberly-Clark Corporation. Sanitary napkin. 3,886,942, Cl. 128-290.000.

Berner, Erling. Air curtain device. 3,886,851, Cl. 98-36.000.

Bernhardt, Thomas Joseph; and Klein, Frank N., to Eaton Corp. Fuseless inverter. 3,887,860, Cl. 321-14.000.

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Bertalot, Silvio, to U.S. Philips Corporation. Telescoping support mechanism. 3,887,155, Cl. 248-333.000.

Betz Laboratories, Inc.: *See—*
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Bez, Ulrich, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Collision energy dissipation apparatus for a passenger motor vehicle. 3,887,223, Cl. 293-70.000.

Bickerdike, Robert Lewis; Mair, William Norman; and Thomas, Evan Samuel, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State of Defence in Her Majesty's Government of the. Temperature control. 3,887,001, Cl. 165-81.000.

Bierwirth, Egon: *See—*
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Bignell, Fred A., to Emporium Specialties Co., Inc. Fluid-operated clutch with wear limiting stop. 3,887,051, Cl. 192-85.0AA.

Billette, Richard J.; and Vennard, John, to National Semiconductor Corporation. Semiconductor pressure transducer employing temperature compensation circuits and novel heater circuitry. 3,886,799, Cl. 73-398.0AR.

Bimber, Russell M.: *See—*
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Bishop, John W. H.: *See—*
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Blanc, Henri. Load-handling appliance. 3,887,209, Cl. 280-43.210.

Blanchard, James G. Rotary-piston internal combustion engine. 3,886,913, Cl. 123-44.00D.

Blau, Henry H., Jr.; and Kebabian, Paul L., to Environmental Research & Technology, Inc. Light equalizer and method of making same. 3,887,262, Cl. 350-1.000.

Blauert, Hans Joachim; Jejina, Filip; and Reisch, Hans, to Siemens Aktiengesellschaft. Communication monitoring circuit. 3,887,824, Cl. 307-294.000.

Blay, Jorge A., to Celanese Corporation. Thermal purification of terephthalic acid using group I-B, II-B, VIII catalysts. 3,887,613, Cl. 260-525.000.

Bligh, Bernard Ramsay: *See—*
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Block, Charles, to Joseph Galkin Corporation. Automatic fabric handling apparatus. 3,886,878, Cl. 112-121.270.

Block Engineering, Inc.: *See—*
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Young, Niels O., 3,887,221.

Blocker, Erich; Rupp, Walter; and Jakob, Franz, to Hoechst Aktiengesellschaft. Light-stabilized synthetic linear polyesters and shaped structures made therefrom. 3,887,521, Cl. 260-47.00C.

Bloom, Stanley M., to Polaroid Corporation. Novel compounds, syntheses and the uses thereof. 3,887,563, Cl. 260-286.00R.

Blumbergs, John H.: *See—*
Lancelot, Charles J.; Blumbergs, John H.; and MacKellar, Donald G., 3,887,526.

Bobeck, Andrew Henry; and Scovil, Henry Evelyn Derrick, to Bell Telephone Laboratories, Incorporated. Magnetic domain shifting arrangement employing movable strip domain. 3,887,905, Cl. 340-174.0TF.

Bobo, Donald E.; and McPhee, Charles J., to American Hospital Supply Corporation. Medical administration set for dispensing plural medical liquids. 3,886,937, Cl. 128-214.00R.

Bochynsky, Frank J., to Byke Co., The. Backrest for wheeled vehicles. 3,887,231, Cl. 297-366.000.

Bock, Ronald E.: *See—*
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Bodas, Janos: *See—*
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Bodine, Roger E. Method for testing accuracy of machine tool control programs. 3,886,846, Cl. 90-11.00C.

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Boehringer, John R. Gas sampling device. 3,886,800, Cl. 73-421.50R.

Boeing Company, The: *See—*
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Boelens, Harmannus; and Traas, Petrus C., to Naarden International NV. Process for the preparation of sesquiterpene ketones. 3,887,622, Cl. 260-586.00P.

Bogaert, Pierre Emmanuel Eugene Jean. Top for a skylight side member. 3,886,701, Cl. 52-200.000.

Bolduc, Lee R.; and Dickhudt, Eugene A., to Population Research Incorporated. Apparatus for puncturing and collapsing a container. 3,887,112, Cl. 222-85.000.

Boliden Aktiebolag: *See—*
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Bollig, George; Brock, Klaus; and Niendorf, Alfred, to Schloemann-Siemag Aktiengesellschaft. Continuous casting installation equipped with mold support pivotable out of a casting position. 3,886,995, Cl. 164-260.000.

Bolstad, Richard; and Melchoni, Anna F., to Inmont Corporation. Ammonium salts of resinous polycarboxylic acids. 3,887,509, Cl. 260-29.10R.

Bomanite Corporation: *See—*
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Boncey, Graham Arthur; Hedge, Maurice John; and Henderson, James Rae, to Aspro Nicholas Ltd. Analgesic formulations. 3,887,700, Cl. 424-44.000.

Boniek, Klaus, to Inventio Aktiengesellschaft. Device for controlling a lift or the like. 3,887,039, Cl. 187-29.00R.

Borden, Inc.: *See—*
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Borenstein, David E.; and Newton, Richard C., to Phillips Petroleum Company. Yarn processing. 3,886,636, Cl. 28-72.110.

Borg-Warner Corporation: *See—*
Hoppesch, Joseph P.; Ward, Donald H.; and Tomashek, James R., 3,886,786.
Hoppesch, Joseph P.; Ward, Donald H.; and Tomashek, James R., 3,886,929.
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Bosniack, David S., to Exxon Research and Engineering Company. Adhesive composition and methods. 3,887,422, Cl. 156-334.000.

Bossert, Friedrich: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,887,558.

Bossler, Robert B., to Kaman Aerospace Corporation. Bolt head which measures and maintains preload. 3,886,840, Cl. 85-62.000.

Bourg, Christian Pierre: *See—*
Paulus, Jean; and Bourg, Christian Pierre, 3,887,176.

Bourne, Joseph R., to Carrier Corporation. Fluid distributor. 3,887,131, Cl. 239-110.000.

Boutonnat, Maurice, to Charbonnages de France; and MSA de France. Electrical measuring and monitoring apparatus utilising a remote detector. 3,887,335, Cl. 23-254.00E.

Bower, Richard. Expandable belt. 3,886,727, Cl. 59-79.00B.

Bowman, Bradshaw, to Bomanite Corporation. Method for imprinting non-repeating stone patterns in fresh concrete. 3,887,293, Cl. 404-72.000.

Boxer, Steve. Device for alleviating muscular discomfort. 3,886,939, Cl. 128-268.000.

Boyer, Carl W.: *See—*
MacInnis, Martin B.; Vanderpool, Clarence D.; and Boyer, Carl W., 3,887,680.

Boyles, Robert L., to General Electric Company. Alarm clock timer. 3,886,723, Cl. 58-21.150.

BPB Industries Limited: *See*—
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Brachman, Armand Edward; and McCarron, Edward Michael, to GAF Corporation. Alkyl phenol-hydrazine antioxidants. 3,887,477, Cl. 252-400.00R.

Bradford, John Guythar. Foldable casualty carrier. 3,886,606, Cl. 5-82.000.

Brandt, Ivan L.; and von Alten, Theodor, to Allen-Bradley Company. Fusible resistor. 3,887,893, Cl. 338-262.000.

Bratten, William Richard, to Baxter Laboratories, Inc. Die assembly for heat-sealing tubing ends to sheeting in transverse relationship. 3,887,323, Cl. 425-521.000.

Bratter, Robert L.; and Gaind, Arun K., to International Business Machines Corporation. Method of chemical vapor deposition to provide silicon dioxide films with reduced surface state charge on semiconductor substrates. 3,887,726, Cl. 427-95.000.

Brawn, Darrell S., to Eaton Corp. Inflatable vehicle occupant restraint system and means for supporting same. 3,887,214, Cl. 280-150.0AB.

Bray, Donald T., to Desalination Systems, Inc. Reverse osmosis system with automatic valve for module operation control. 3,887,463, Cl. 210-110.000.

Bray, Donald T., to Desalination Systems, Inc. Feed water chlorinator for a reverse osmosis system. 3,887,468, Cl. 210-206.000.

Breinig, Harry V. Fire escape. 3,887,033, Cl. 182-78.000.

Brekle, Oliver R., to M & B Metal Products Company. Apparatus for cleaning and coating wire. 3,886,894, Cl. 118-6.000.

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Breslow, Jeffrey D., to Marvin Glass & Associates. Fluid stream game apparatus. 3,887,182, Cl. 273-1.00E.

Bresson, Richard J., to Eastman Kodak Company. Light compensation for exposure control cameras. 3,887,930, Cl. 354-59.000.

Breuer, Hermann; and Treuner, Uwe D., to E. R. Squibb & Sons, Inc. 5-Mercaptoalkyl-1,2,4-oxadiazole derivatives. 3,887,573, Cl. 260-307.00G.

Bridges, John A.; and Wyatt, W. Burk, to Aladdin Industries, Incorporated. Food service cart. 3,887,253, Cl. 312-250.000.

Bright, Cooper B., to Rutgers University. Aircraft with combination stored energy and engine compressor power source for augmentation of lift, stability, control and propulsion. 3,887,146, Cl. 244-12.00R.

Brill, Eugene L. Oil detector. 3,887,907, Cl. 340-236.000.

British Insulated Callender's Cables Limited: *See*—
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British Steel Corporation: *See*—
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Brock, Klaus: *See*—
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Brockmann, Heinz, to Brobu Industrie-Ofenbau GmbH & Co. KG. Walking beam conveyor in a furnace. 3,887,064, Cl. 198-219.000.

Broderson, John C. Method for constructing an awning. 3,886,646, Cl. 228-182.000.

Brokaw, Adrian Paul, to Analog Devices, Incorporated. Solid-state regulated voltage supply. 3,887,863, Cl. 323-19.000.

Brongo, Ralph T.; Fleming, James C.; and Manthey, Joseph W., to Eastman Kodak Company. Tetrazolium alt photoreductive imaging. 3,887,374, Cl. 96-48.00R.

Bronicki, Lucien Yehuda, to Ormat Turbines (1965) Ltd. Closed rankine cycle power plant and condenser therefor. 3,886,748, Cl. 60-651.000.

Brookfield, Donald W. Viscometer. 3,886,789, Cl. 73-59.000.

Brooks, Frank, to Foscolor Limited. Mixing apparatus. 3,887,168, Cl. 259-16.000.

Brooks, Robert A., to Magnetic Analysis Corporation. Eddy current testing apparatus using segmented monoturn conductive members. 3,887,865, Cl. 324-40.000.

Brooks, Robert H.: *See*—
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Brothers, Don R.; and Stewart, Edwin D., to Century Industries Corporation. Method for forming caulking tube cartridges. 3,886,711, Cl. 53-14.000.

Brown Boveri-Sulzer Turbomaschinen Aktiengesellschaft: *See*—
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Brown, Harold F. Accessory attachment for a vehicle used for fluid spraying of vegetation. 3,887,129, Cl. 239-119.000.

Brown International Corporation: *See*—
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Brown, James Peter; Jenner, Edwin Gordon; and Wilcock, John, to Imperial Chemical Industries Limited. Process for preparing solvent-soluble polyurethanes. 3,887,525, Cl. 260-77.5AA.

Brown, Robert L. Surveying apparatus stake cutter. 3,886,826, Cl. 83-13.000.

Browne, Frank H., to General Motors Corporation. Impact energy absorber with radially adjustable flow metering. 3,887,224, Cl. 293-85.000.

Bruck, Erhard, to Wilhelm Loh Kommanditgesellschaft. Mounting device for optical lenses. 3,886,696, Cl. 51-216.0LP.

Bruderer, Hans; Richle, Rolf; and Ruegg, Rudolf, to Hoffmann-La Roche Inc. Pyrazole derivatives. 3,887,548, Cl. 260-240.00A.

Bruderer, Werner: *See*—
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Brundige, Clayton L.; and Bechman, William H., to Eaton Corp. Material handling apparatus. 3,887,098, Cl. 214-762.000.

Brunet, Jacques; and Rigaux, Jean-Claude, to La Cellophane. Method of molding using a polyethylene terephthalate release film coated with polyethylene sebacate. 3,887,579, Cl. 264-316.000.

Brunnthaler, Erich: *See*—
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Brzozowski, Zdzislaw; Angielski, Stefan; and Wojcikowski, Czeslaw. 2-Pyrazoline-1-carboxamide sulfonamide derivatives useful as hypoglycemic agents. 3,887,709, Cl. 424-273.000.

Bucey, Jackson P. Finger-tip writing instrument. 3,887,286, Cl. 401-7.000.

Buchel, Karl Heinz: *See*—
Draber, Wilfried; Buchel, Karl Heinz; Regel, Erik; and Plempel, Manfred, 3,887,556.

Buck, Charles Herbert, to Liberty Winery, Inc. Transfer apparatus for bulk grapes. 3,887,091, Cl. 214-38.00R.

Budecker, Ludwig; and Von Grunberg, Hubertus, to ITT Industries, Inc. Pressure operated directional control valve. 3,886,848, Cl. 91-412.000.

Bueler, Richard C., to Wagner Electric Corporation. Quick installation vehicle wheel sensor. 3,887,046, Cl. 188-181.00A.

Buford, John T., to United States of America, Energy Research and Development Administration. Recovery of boron from a polymer matrix. 3,887,687, Cl. 423-292.000.

Bullard, David E.; and Allen, Jan K., to Caterpillar Tractor Co. Cooling circuit for a vehicle transmission. 3,886,814, Cl. 74-730.000.

Bullivant, Kenneth W., to K-Tron Corporation. Density control feeder system. 3,887,111, Cl. 222-57.000.

Bungs, Janis A.: *See*—
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Buning, Robert: *See*—
Looman, Wolfgang; Pungs, Wolfgang; Bierwirth, Egon; and Buning, Robert, 3,887,728.

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Bunnelle, Philip R., to FMC Corporation. Liquid-gas separator unit. 3,887,342, Cl. 55-203.000.

Burgdorf, Jochen; and Eikenberg, Dieter, to ITT Industries, Inc. Spot-type disc brake. 3,887,044, Cl. 188-73.500.

Burger, Anthony John. Portable cleaning device for outboard motors. 3,886,889, Cl. 115-.50R.

Burgess, George A.: *See*—
Reckseit, Bernard S.; and Burgess, George A., 3,887,090.

Burkett, Wilford B.; and Carlsen, George D., II, to McCulloch Corporation. Battery charging. 3,887,858, Cl. 320-31.000.

Burroughs Corporation: *See*—
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Colegrove, James Anthony; and Seeley, Dunham Briggs, 3,886,898.
Lehmann, Jerry Hans, 3,887,056.

Busch, Johannes; Roser, Herbert; and Sedlacek, Hugo, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Hinge support, especially for a bridge. 3,886,613, Cl. 14-14.000.

Buschbom, Floyd E.; Hansen, Glen Dale; and Wolfe, Walter W., to Veda, Inc. Lift apparatus. 3,887,038, Cl. 187-27.000.

Bushman, Ronald C., to Brown International Corporation. Side entry hopper for rotary fruit feeder. 3,887,062, Cl. 198-52.000.

Busuzima, Shigeo: *See*—
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Butler, Anthony J.; and Pail, Daniel R., to Dow Corning Corporation. Oil resistant leather. 3,887,758, Cl. 428-540.000.

Byke Co., The: *See*—
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Bystrom, Sven Borje: *See*—
Stromstedt, Sven Sixten; and Bystrom, Sven Borje, 3,886,774.

C. Keller u. Co.: *See*—
Kamhues, Hermann, 3,887,060.

C. P. Bourg: *See*—
Paulus, Jean; and Bourg, Christian Pierre, 3,887,176.

C. Reichert Optische Werke, AG: *See*—
Merstallinger, Kurt; and Schindl, Klaus P., 3,887,283.

Caccamo, Samuel E. Camouflage remover on duck blind. 3,886,678, Cl. 43-1.000.

Caillot, Robert: *See*—
Alais, Michel; Caillot, Robert; and Corcelle, Francois, 3,887,784.

Cairns, Elton J.: *See*—
Walsh, William J.; Chilenskas, Albert A.; Cairns, Elton J.; and Nelson, Paul A., 3,887,396.

California Computer Products, Inc.: *See*—
Trousdale, Robert B.; Seid, Eugene; and Smith, William E., 3,887,796.

Calpha, Arthur J., Jr.: *See*—
Erlewine, Richard H.; Richter, Charles W., III; and Calpha, Arthur J., Jr., 3,887,320.

Camp, Michel; and Rostaing, Paul, to Rhone-Poulenc, S.A. Process for removing bubbles of gas from liquids. 3,887,487, Cl. 252-321.000.

Campbell, Roger G.; Goff, Richard E., Jr.; and Guay, Normand D., to Johnson & Johnson. Narrow elastic fabric for apparel waistbands. 3,886,598, Cl. 2-237.000.

Campione, Joseph C. Integral universal stretcher bar. 3,886,990, Cl. 160-374.100.

Camsco, Inc.: *See—*
Martell, Charles Ronald, 3,887,903.

Canadian Occidental Petroleum, Ltd.: *See—*
Chalmers, William W., 3,887,130.

Canadian Patents and Development Limited: *See—*
Juneja, Subhash C., 3,887,511.

Canfield, Charles L. Downhole gas compression technique. 3,887,008, Cl. 166-267.000.

Canon Kabushiki Kaisha: *See—*
Matsuno, Hiroshi; and Endo, Ichiro, 3,887,369.
Nagashima, Shinichiro; and Tuneda, Terukuni, 3,887,560.

Canron Inc.: *See—*
Maisonneuve, Hubert; and von Beckmann, Helmut, 3,886,675.

Cante, Charles John; and Moreno, Victor, to General Foods Corporation. Edible polyunsaturated emulsions. 3,887,715, Cl. 426-570.000.

Canter, Lawrence E.: *See—*
Lammy, James E.; Francis, Thomas; and Canter, Lawrence E., 3,886,611.

Carabott, Carmel John Angelo; and Ross, Jaffray Stuart, to Stenprint Limited. Stencil stamp with air valve and protective stencil. 3,886,863, Cl. 101-125.000.

Caradot, Patrice, to Milbras. Self-clamping grip for a free cable winch. 3,886,631, Cl. 24-134.00N.

Carding, John Raymond; and Peover, Cyril, to Imperial Chemical Industries Limited. Carbonation of ammoniacal sodium chloride brine. 3,887,689, Cl. 423-423.000.

Carlsen, George D., II: *See—*
Burkett, Wilford B.; and Carlsen, George D., II, 3,887,858.

Carrier Corporation: *See—*
Bourne, Joseph R., 3,887,131.

Carrock, Frederick E.; and Chu, Frank K. Y., to Dart Industries Inc. Process for producing transparent graft polymer compositions. 3,887,652, Cl. 260-880.00R.

Caruso, Fred A.: *See—*
Long, Robert B.; Caruso, Fred A.; DeFeo, Richard J.; and Walker, David G., 3,887,600.

Casella, Michael D. Rocking chair or cradle with rocking mechanism. 3,886,608, Cl. 5-109.000.

Cash, Walter A. Dental floss holder. 3,886,956, Cl. 132-91.000.

Caswell, Robert L., to Rockwell International Corporation. CRT assembly. 3,887,766, Cl. 178-7.820.

Caterpillar Tractor Co.: *See—*
Bailey, John M.; and Cobb, Delwin E., 3,887,237.
Bullard, David E.; and Allen, Jan K., 3,886,814.
Engel, Henry L., 3,886,984.
Engelking, Frederick S.; and Durham, Donald F., 3,887,200.
Haslett, Glenn M.; and Reinsma, Harold L., 3,887,244.
Jeter, Harold W., Jr., 3,886,788.
Johnson, Gordon W., 3,886,742.
McClure, William M.; and Klintworth, Keith K., 3,887,198.
Scholl, Rolland Dale; Coleman, Donald Frederick; Johnson, Edward Lawrence; and Streight, William Edward, 3,887,012.
Weber, Robert L., 3,886,808.

Cav, Inc.: *See—*
Franklin, Charlotte S.; and Franklin, Burton P., 3,886,596.

Cavaliere, Joseph. Hand-held and manipulated catch ball game. 3,887,184, Cl. 273-96.00R.

Cavanagh, Joseph C., to Midland Glass Company. Method for coating glass containers. 3,887,729, Cl. 427-195.000.

Cawthorne, Michael Anthony, to Beecham Group Limited. 6-Aminopenicillanic acid preparation. 3,887,432, Cl. 195-36.00P.

CBS Inc.: *See—*
Meshulam, Avram; and Rebold, Jerome, 3,886,656.

Cecchin, Gildo, to Motorola, Inc. IC color demodulator with single external picture control. 3,887,938, Cl. 358-27.000.

Celanese Corporation: *See—*
Blay, Jorge A., 3,887,613.
Scott, Robert H.; and Gaulding, Dan L., 3,887,488.

Cenker, Moses: *See—*
Demou, John G.; and Cenker, Moses, 3,887,505.
Narayan, Thirumurti L.; and Cenker, Moses, 3,887,501.

Century Data Systems, Inc., A Division of California Computer Products, Inc.: *See—*
Horowitz, Noah, 3,887,942.

Century Industries Corporation: *See—*
Brothers, Don R.; and Stewart, Edwin D., 3,886,711.

Ceraver: *See—*
Weber, Jean; and Moussou, Jean, 3,887,327.

Chabrak, Thomas A.: *See—*
Labran, Garrie; and Chabrak, Thomas A., 3,886,617.

Chaffin, John D. Apparatus for geological drilling and coring. 3,887,020, Cl. 175-206.000.

Chalmers, William W., to Canadian Occidental Petroleum, Ltd. Sulfur pelletizing. 3,887,130, Cl. 239-132.500.

Champ, Robert Bruce; and Shattuck, Meredith David, to International Business Machines Corporation. Cyanine pigments in electrophotographic processes. 3,887,366, Cl. 96-1.0PC.

Champion International Corporation: *See—*
Cohn, Robert, 3,887,414.

Chan, Lock-Lim; and Amy, John Edward, to Borden, Inc. Process for low temperature preparation of aqueous solution of polyalkylene amine-polyamide resins. 3,887,510, Cl. 260-29.20N.

Chandor Limited: *See—*
Unwin, Derek Keith, 3,886,897.

Chandra, Grish, to Dow Corning Limited. Complexes containing sulphur. 3,887,599, Cl. 260-429.00R.

Chane, Jean-Paul, to U.S. Philips Corporation. Method of manufacturing semiconductor devices. 3,887,404, Cl. 156-8.000.

Change, Nicholas D.; and Riggs, Michael T., to PCB Piezotronics, Inc. Conformal pressure transducer for ammunition testing. 3,886,792, Cl. 73-1[illegible]7.000.

Chapela Lago, Eduardo: *See—*
Escribano Nevado, Antonio; Chapela Lago, Eduardo; and Gutierrez Hernandez, Jesus, 3,887,693.

Charbonnages de France: *See—*
Boutonnat, Maurice, 3,887,335.

Charlson, Paul Marlin; Green, Charles Donald; Harris, William John; and Inman, Keith Erwin, to International Business Machines Corporation. Ticket cartridge and hopper and stacker therefor. 3,887,106, Cl. 221-197.000.

Chase Brass and Copper Co.: *See—*
Law, Anthony G.; and Johnson, James E. (said Anthony G. Law assors. to), 3,886,831.

Chattin, John Henry. Stone cutter. 3,886,927, Cl. 125-23.00C.

Chaumont, Guy Noel, to Dayco Corporation. Endless track. 3,887,243, Cl. 305-24.000.

Chavez, Victor J.: *See—*
Scott, Paul R.; Chavez, Victor J.; and Kruka, Vitold R., 3,886,972.

Chazan, David J., to Dymo Industries, Inc. Embossing tape. 3,887,734, Cl. 428-40.000.

Check, Donald R.; and Kilbourn, Lawrence L., to Olin Corporation. Ski boot with forward lean wedge. 3,886,673, Cl. 36-2.5AL.

Chemetron Corporation: *See—*
Eyrick, Theodore B.; and Hattes, Neil R., 3,887,795.

Chesnick, John C. Archery bow with nocking point on the bowstring. 3,886,924, Cl. 124-23.00R.

Chevron Research Company: *See—*
Hickson, Donald A., 3,887,454.
Hughes, Mack F., 3,887,634.
Sweeney, William A.; and House, Ralph, 3,887,611.
Woo, Gar Lok, 3,887,504.

Chiappe, Wayne T., to Continental Can Company, Inc. Non-detachable tear flap and tab for containers. 3,887,105, Cl. 220-277.000.

Chilenskas, Albert A.: *See—*
Walsh, William J.; Chilenskas, Albert A.; Cairns, Elton J.; and Nelson, Paul A., 3,887,396.

Chin, Edward G. H.: *See—*
Schwartz, Leonard; and Chin, Edward G. H., 3,887,926.

Cho, Yohan: *See—*
Connolly, John B.; and Cho, Yohan, 3,887,869.

Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, to Hoffmann-La Roche Inc. Allyl ethers. 3,887,586, Cl. 260-348.00R.

Chorvat, Robert J.; and Pappo, Raphael, to G. D. Searle & Co. 3-Alkoxy-2-azaestratrienes. 3,887,567, Cl. 260-289.0AZ.

Christensen, Burton G., to Merck & Co., Inc. Process for preparing 7-acylamido-7-methoxy-3-cephem-4-carboxylic acid, esters and salts. 3,887,549, Cl. 260-243.00C.

Christensen, Charles M.: *See—*
Schnirel, David R.; Zimmerman, William T.; Barsell, Birger E.; and Christensen, Charles M., 3,886,612.

Christensen, James L.; and Howard, Thomas B., to United States of America, Navy. High speed microwave switching logic for eccm. 3,887,919, Cl. 343-18.00E.

Christiansen, Soren Bent, to F. L. Smidth & Co. Cement manufacture. 3,887,388, Cl. 106-100.000.

Chromalloy American Corporation: *See—*
Baer, Robert B., 3,887,449.
Dean, Michael F.; Borougerdi, Hossein; and Puchot, John A., 3,887,731.
Ellis, John L.; Mal, M. Kumar; and Tarkan, Stuart E., 3,886,637.

Chrysler Corporation: *See—*
Santini, Mario P., 3,886,761.

Chryst, Anton W.: *See—*
Gilbert, George T.; and Chryst, Anton W., 3,887,143.

Chu, Frank K. Y.: *See—*
Carrock, Frederick E.; and Chu, Frank K. Y., 3,887,652.

Chupp, John P.; and Tung, Ching C., to Monsanto Company. Herbicidal composition and methods employing n-(1-alken-1-yl)-amino-S-triazine compounds. 3,887,355, Cl. 71-93.000.

Chupp, John P., to Monsanto Company. Herbicidal compositions and methods employing N-(1-cycloalken-1-yl)-amino-S-triazine. 3,887,356, Cl. 71-93.000.

Ciba-Geigy AG: *See—*
Deiner, Hans, 3,887,390.
Hegar, Gert; Angliker, Hans-Joerg; Lang, Walter; Liechti, Hans Wilhelm; and Milicevic, Branimir, 3,887,329.
Nachbur, Hermann; and Maeder, Arthur, 3,887,553.
Oswald, Alexis A.; and Valint, Paul L., 3,887,658.

Ciba-Geigy Corporation: *See—*
Eicke, Hans; Arnold, Vladimir; and L'Eplattenier, Francois, 3,887,598.
Hofmann, Peter; and Rohringer, Peter, 3,887,654.
Rosenberger, Siegfried; and Schwarzenbach, Kurt, 3,887,518.

Winter, Roland A. E.; and Villani, Thomas J., 3,887,554.

Cicchiello, Frank N., to Burroughs Corporation. Push-button-operated motor speed control circuit. 3,887,856. Cl. 318-345.000.

Cichetti, Michael Peter, Jr.; and Fretz, Robert Jeffrey, to Bell Telephone Laboratories, Incorporated. Frame synchronization of elastic data bit stores. 3,887,769, Cl. 178-69.50R.

Cier, Andre; Gero, Stephan; and Olesker, Alain, to Labaz. Azido cyclohexanepentol derivative. 3,887,590, Cl. 260-349.000.

Cincinnati Milacron Chemicals, Inc.: *See—*
Weisfeld, Lewis B.; and Witman, Robert C., 3,887,519.

Cities Service Oil Company: *See—*
Rosenwald, Gary W., 3,887,005.

Clark Equipment Company: *See—*
Haluda, Raymond P.; and Nelson, Kenneth W., 3,887,037.
Hansen, Howard C., 3,887,282.

Clark, Irvin Dwight, to Special Metals Corporation. Method for powder metal production. 3,887,667, Cl. 264-8.000.

Clark, John Colin: *See—*
Phillipps, Gordon Hanley; Stephenson, Leslie; Cooksey, Albert Roy; and Clark, John Colin, 3,887,606.

Clark, Merlin O.: *See—*
McClintock, William A.; and Clark, Merlin O., 3,886,757.

Classic Games Company, Inc.: *See—*
Krause, Franz; and Shulberg, Austin T., 3,886,710.

Clay, Burton Ross; and Gore, Douglas Alan, to United States of America, Navy. Rapidly accessible optically stored information. 3,887,276, Cl. 353-26.000.

Clecak, Nicholas J.; and Cox, Robert J., to International Business Machines Corporation. Photoresist azide sensitizer composition. 3,887,379, Cl. 96-115.00R.

Clem, Kenneth R.: *See—*
Hamner, Glen P.; and Clem, Kenneth R., 3,887,455.

Clendenen, Harold K.: *See—*
Roberts, Maurice P.; and Clendenen, Harold K., 3,886,849.

Cleveland Machine Controls, Inc.: *See—*
Klimo, Robert G., 3,887,855.

Coats, George I.: *See—*
Morgan, Tommie J.; Coats, George I.; Kisielewski, Richard W.; and Showalter, Charles K., 3,887,804.

Cobaugh, Robert Franklin; and Coller, James Ray, to AMP Incorporated. Method and apparatus for precrimping solder rings on electrical terminal posts. 3,886,650, Cl. 228-136.000.

Cobb, Delwin E.: *See—*
Bailey, John M.; and Cobb, Delwin E., 3,887,237.

Cobo Barrachina, Gonzalo, to Laboratorios Berenguer Beneyto S.A. Salt of polymannuronic acid and dihydroquinidine. 3,887,562, Cl. 260-284.000.

Cochard, Pierre E.; and Vandecauter, Roger, to Laboratoires G.-A. Cochard. Quinidine alginate and process of preparation thereof. 3,887,175, Cl. 260-209.600.

Codex Corporation: *See—*
Forney, George David, Jr.; and Gallager, Robert G., 3,887,768.

Codrino, Giuseppe. Multiple coupling connector for electrical connection. 3,887,255, Cl. 339-17.00L.

Codrino, Guiseppe. Multiple coupling connector for electrical connection between flexible ribbon-like conductors and circular cross-section cables. 3,887,260, Cl. 339-176.0MF.

Coggins, Dolphus L., to McDonnell Douglas Corporation. Process and solution for removing titanium and refractory metals and their alloys from tools. 3,887,403, Cl. 156-7.000.

Cohen, Marvin: *See—*
Von Strandtmann, Maximilian; Shavel, John, Jr.; Klutchko, Sylvester; and Cohen, Marvin, 3,887,584.

Cohen, Robert A.: *See—*
Natman, Solomon; and Cohen, Robert A., 3,886,619.

Cohn, Robert, to Champion International Corporation. Envelope window patching. 3,887,414, Cl. 156-108.000.

Coil, Frederick J. Extensible beam compass. 3,886,664, Cl. 33-27.00C.

Cole, David F. Sealed gas tank. 3,887,104, Cl. 220-85.00B.

Cole, Edward N., to General Motors Corporation. Heated manifold. 3,886,918, Cl. 123-122.0AC.

Cole, John B., to Midland-Ross Corporation. Method of forming flat bottoms on bags of creasable material. 3,886,850, Cl. 93-35.0SB.

Colegrove, James Anthony; and Seeley, Dunham Briggs, to Burroughs Corporation. Multiple, contiguous stripe, extrusion coating apparatus. 3,886,898, Cl. 118-411.000.

Coleman, Donald Frederick: *See—*
Scholl, Rolland Dale; Coleman, Donald Frederick; Johnson, Edward Lawrence; and Streight, William Edward, 3,887,012.

Colgate-Palmolive Company: *See—*
Nachtigal, Julius Harvey, 3,887,701.

Colglazier, David E.: *See—*
Larson, Willis A.; and Colglazier, David E., 3,887,848.

Coller, James Ray: *See—*
Cobaugh, Robert Franklin; and Coller, James Ray, 3,886,650.

Collura, Peter C.; and Kipp, Michael A., to Container Corporation of America. Package. 3,887,067, Cl. 206-45.140.

Colorant Schmuckstein GmbH: *See—*
Elbe, Maximo, 3,886,695.

Colt Industries Operating Corp.: *See—*
Henderson, Robert McDougall, 3,886,916.
Roubloff, Alexander D., deceased; and Peiser, Adolf E., 3,886,652.

Combustion Engineering, Inc.: *See—*
Nickerson, Robert D.; and Messman, Henry Cashel, 3,887,461.

Comette, Robert, to Societe Honeywell Bull (Societe Anonyme). Devices for welding of integrated-circuit wafers. 3,887,783, Cl. 219-85.000.

Commercial Solvents Corp.: *See—*
Wehrmeister, Herbert L.; Johnston, David B. R.; and Windholz, Thomas B. (said Herbert L. Wehrmeister assors. to), 3,887,583.

Commissariat a l'Energie Atomique: *See—*
Alais, Michel; Caillot, Robert; and Corcelle, Francois, 3,887,784.

Compagnie Honeywell Bull (Societe Anonyme): *See—*
Labalme, Pierre, 3,887,902.

Compagnie Industrielle des Tellecommunications CIT-Alcatel: *See—*
Van Cakenberghe, Jean, 3,886,896.

Computer Identics Corporation: *See—*
Goodfinger, Frank Carl; and Tuhro, Richard H., 3,887,793.

Concast AG: *See—*
Meier, Walter; and Bruderer, Werner, 3,886,991.

Connell, Joseph A., to NRG Incorporated. Pneumatic energy source utilizing liquid oxygen. 3,886,733, Cl. 60-39.480.

Connolly, John B.; and Cho, Yohan, to Tau-tron, Inc. Method and apparatus for high speed digital circuit testing. 3,887,869, Cl. 324-73.00R.

Consortium fur Elektrochemische Industrie GmbH: *See—*
Lottes, Karlheinz; and Katzer, Hans, 3,887,528.

Container Corporation of America: *See—*
Collura, Peter C.; and Kipp, Michael A., 3,887,067.

Conti, Fulvio. Width washing plant, particularly for delicate fabrics. 3,886,769, Cl. 68-15.000.

Continental Can Company, Inc.: *See—*
Chiappe, Wayne T., 3,887,105.

Continental Carbon Company: *See—*
West, Jesse R.; Middlebrooks, Ollie; and Crull, William B., 3,887,690.

Continental Gummi-Werke Aktiengesellschaft: *See—*
Jaedicke, Roland; and Schmidt, Ulfert, 3,887,313.

Continental Oil Company: *See—*
Tarter, James H.; and McCain, David L., 3,886,965.

Contraves AG: *See—*
Guggenbuhl, Walter, 3,887,868.
Heller, Rudolf, 3,887,267.

Control Data Canada, Ltd.: *See—*
Plett, Edelbert G., 3,886,790.

Controlled Printout Devices, Inc.: *See—*
Ploeger, Walter, Jr.; and Bishop, John W. H., 3,887,727.

Cook, Newell C.; and Gasaway, John M., to General Electric Company. Process for making nitrophthalic anhydrides. 3,887,588, Cl. 260-346.300.

Cooksey, Albert Roy: *See—*
Phillipps, Gordon Hanley; Stephenson, Leslie; Cooksey, Albert Roy; and Clark, John Colin, 3,887,606.

Cookson, Ronald Frederick: *See—*
Rodway, Ronald Ernest; and Cookson, Ronald Frederick, 3,887,566.

Cooley, Austin G., to Litton Medical Products, Inc. Optical system for x-ray scanning equipment. 3,887,816, Cl. 250-571.000.

Coombs, William Charles. Winch. 3,887,164, Cl. 254-175.500.

Coors Container Company: *See—*
Pearce, Ronald A.; and Herrmann, Thomas R., 3,886,881.

Corble, John C.: *See—*
Reed, Robert D.; Zink, John Smith; Schwartz, Robert F.; Glomm, Horst; Corble, John C.; and Koons, Harold F., 3,887,324.

Corcelle, Francois: *See—*
Alais, Michel; Caillot, Robert; and Corcelle, Francois, 3,887,784.

Corey, Elias J.: *See—*
Schaaf, Thomas K.; and Corey, Elias J., 3,887,587.

Cornett, John W. Support. 3,887,154, Cl. 248-156.000.

Cornier, Sally P.; Tefertiller, Ben A.; and Dolinski, Richard J., to Dow Chemical Company, The. Quaternary ammonium electroconductive resin coating compositions. 3,887,496, Cl. 252-500.000.

Corning Glass Works: *See—*
Dahlman, Frederick A.; Mras, Raymond J., deceased; and Mras, Carl A., executor, 3,887,351.
Dwyer, Thomas J., 3,887,741.
Foster, Gordon F.; Meissner, Helmuth E.; and Stiles, Janice L., 3,887,740.

Cornland, Georg Valentin, to Hoganas AB. Hollow structural panel of extruded plastics material and a composite panel structure formed thereof. 3,886,705, Cl. 52-586.000.

Corrigan, Eugene J.: *See—*
Pullum, Donald G.; Corrigan, Eugene J.; Howard, Bernard H.; and Stabley, Bernard D., 3,887,749.

Cottingham, Robert A., to Polymer Corporation, The. Apparatus for the extrusion of ultra high molecular weight polymeric resins. 3,887,319, Cl. 425-379.00R.

Coudrin, Gerard: *See—*
Bernard, Michel Louis; and Coudrin, Gerard, 3,887,696.

Coven, Monroe J.; and Moss, Chester C., to Monarch Wine Co., Inc. Anti strip overcap for metal screw caps for bottles or containers. 3,887,100, Cl. 215-256.000.

Cox, Robert J.: *See—*
Clecak, Nicholas J.; and Cox, Robert J., 3,887,379.

Cramer, Henry E.; Gerkin, James M.; Groh, Dale L.; and Groh, Gale A., to United States of America, Navy. Projectile body testing machine. 3,886,793, Cl. 73-167.000.

Crescentini, Lamberto; and Wells, Rodney Lee, to Allied Chemical Corporation. Antistatic fiber containing chain-extended tetrols based on diamines. 3,887,638, Cl. 260-830.00P.

Crew, Beatrice L. Multi-purpose clothes hanger combination. 3,887,079, Cl. 211-118.000.

Criblez, Roger, to Hatebur Umformmaschinen AG. Device for shearing rod sections in an automatic multi-stage cross-fed press. 3,886,829, Cl. 83-198.000.

Crim, Dwight O., to General Motors Corporation. Ignition distributor rotor. 3,887,780, Cl. 200-19.0DR.

Crisp, Harold Alfred; Oughton, John Francis; Sharp, Christopher John; and Wilkinson, Peter Alfred, to Glaxo Laboratories Limited. Crystalline forms of cephaloridine. 3,887,551, Cl. 260-243.00C.

Cross, David C.: *See*—
Howard, Dean D.; and Cross, David C., 3,887,917.

Crossman, Phillip E.; Kenrick, Robert C.; and Le Mieux, Robert W., to Brunswick Corporation. Air cushion table game. 3,887,187, Cl. 273-126.00A.

Crown Cork & Seal Co., Inc.: *See*—
Rodak, John J.; and Macheski, Robert L., 3,887,806.

Crull, William B.: *See*—
West, Jesse R.; Middlebrooks, Ollie; and Crull, William B., 3,887,690.

CSELT-Centro Studi E Laboratori Telecomunicazioni s.p.a.: *See*—
DeVincentiis, Girolamo; and Luvison, Angelo, 3,887,798.

CTS Corporation: *See*—
Rozema, Arthur L.; Saik, John D.; and Arisman, Mervin B., 3,887,892.

Cullinan, George J.: *See*—
Jones, William E.; and Cullinan, George J., 3,887,565.

Culpepper, Clifford, Jr., to Aero-Dyne Manufacturing, Inc. Apparatus for disposing of airborne particulate matter and cooking means. 3,886,854, Cl. 98-115.00K.

Cunningham, Alton J.; Wendt, David W.; and Weber, Bernard R., to Wesbar Corporation. Wire connector means for vehicle lamp. 3,887,258, Cl. 339-95.00D.

Cunningham, Sinclair Upton; and Jackson, Douglas, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. System for controlling the position of a floating vessel. 3,886,887, Cl. 114-230.000.

Cuntze, Ulrich; May, Adolf; and Milewski, Eckhard, to Hoechst Aktiengesellschaft. Softening agent for textiles having a tetrahydropyrimidinium salt component. 3,887,475, Cl. 252-8.800.

Cuomo, Jerome J.; Mayadas, Ashok F.; Rosenberg, Robert; and Sadagopan, Varadachari, to International Business Machines Corporation. Method for sputtering garnet compound layer. 3,887,451, Cl. 204-192.000.

Curtis, William R.; and Trimble, David C., to Hercules Incorporated. Furniture subframe. 3,887,234, Cl. 297-440.000.

Curtiss-Wright Corporation: *See*—
De Feo, Angelo; and Price, Harry N., 3,886,816.
Loyd, Robert W., Jr., 3,886,907.
Pratt, Winthrop B., 3,887,307.

Cusveller, John, to Sperry Rand Australia Limited. Fluid operated actuator for movable members. 3,887,160, Cl. 251-31.000.

Cutter Laboratories, Inc.: *See*—
Kahn, Paul; and Stubstad, James A., 3,886,600.

Dachev, Lyubomir Petrov: *See*—
Julev, Stoyan Iliev; Milkov, Mihail Yordanov; Dachev, Lyubomir Petrov; Vassilev, Rossen Petrov; and Grigorov, Simeon Alexandrov, 3,887,424.

Dageforde, Allen F.: *See*—
Porter, Joe A.; and Dageforde, Allen F., 3,887,194.

Dahlman, Frederick A.; Mras, Raymond J., deceased; and by Mras, Carl A., executor, to Corning Glass Works. Combined turret positioner and clamp assembly for glass pressing machine. 3,887,351, Cl. 65-305.000.

Dai Nippon Printing Co., Ltd.: *See*—
Ohto, Michihiro; Noshiro, Atsumi; Takamizawa, Minoru; and Inoue, Yoshio, 3,886,865.

Daigne, Bernard; and Girard, Francois, to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.). Device for making a casting of a directionally solidified alloy. 3,886,994, Cl. 164-250.000.

Daimler-Benz Aktiengesellschaft: *See*—
Albrecht, Wilhelm; Patzelt, Helmut; and Hoheisel, Peter-Matthias, 3,887,215.
Deckert, Franz, 3,887,227.
Hafner, Gunther, 3,886,921.

Dainippon Ink & Chemicals Inc.: *See*—
Kinoshita, Shoichi; Oyama, Masaji; and Takijiri, Shunjiro, 3,887,581.

Dainippon Ink Institute of Chemical Research: *See*—
Kinoshita, Shoichi; Oyama, Masaji; and Takijiri, Shunjiro, 3,887,581.

Dainippon Pharmaceutical Co. Ltd.: *See*—
Minami, Shinsaku; Matsumoto, Jun-Ichi; Kawaguchi, Kazuyo; Mishio, Shinsaku; Shimizu, Masanao; Takase, Yoshiyuki; and Nakamura, Shinichi, 3,887,557.

Dalabakis, Eli J.: *See*—
Shearer, Harry D.; and Dalabakis, Eli J., 3,887,875.

Dam, Gerhard: *See*—
Senfe, Heinz; Bergmann, Artur; Dam, Gerhard; and Menzel, Dieter, 3,887,474.

Danfoss A/S: *See*—
Knudsen, Ole Friis, 3,887,864.

Dann, Bert H.; and Vidovic, Nikola, to International Video Corporation. Synchronizing pulse processor for a video tape recorder. 3,887,941, Cl. 360-36.000.

Dargie, Philip A., to Malden Mills, Inc. Method of modifying a pile fabric machine. 3,886,767, Cl. 66-9.00B.

Dart Industries Inc.: *See*—
Carrock, Frederick E.; and Chu, Frank K. Y., 3,887,652.
Dieckmann, Dale J., 3,887,508.
Hardy, Donald F., 3,886,891.

Davenport, James D.: *See*—
Taylor, Harold M.; Davenport, James D.; and Hackler, Ronald E., 3,887,708.

Davenport, Joseph A.: *See*—
Raith, Richard L.; and Davenport, Joseph A., 3,886,698.

David Brown Tractors Limited: *See*—
Eastwood, Thomas, 3,886,815.

Davies, Barrie Linton, to Imperial Chemical Industries Limited. Non-woven fabrics. 3,887,417, Cl. 156-181.000.

Davis, John Douglas, to AMP Incorporated. Apparatus for inserting wires into terminals in an electrical connector. 3,886,641, Cl. 29-203.0MW.

Dawes, Milton. Word board game. 3,887,189, Cl. 273-130.0AB.

Dayco Corporation: *See*—
Chaumont, Guy Noel, 3,887,243.
Duckett, John C.; Easley, Wayne W.; and Wickham, William T., 3,887,750.

De La Breteque, Pierre; and Beerli, Marc, to Swiss Aluminum Ltd. Separation of gallium from alkaline liquors using acetylacetone. 3,887,681, Cl. 423-112.000.

de la Poype, Roland, to Prepac (S.A.R.L.). Machine for making and filling sachets. 3,886,714, Cl. 53-180.000.

Dean, Michael F.; Borougerdi, Hossein; and Puchot, John A., to Chromalloy American Corporation. Corrosion resistant coating system for ferrous metal articles having brazed joints. 3,887,731, Cl. 427-258.000.

Deckert, Franz, to Daimler-Benz Aktiengesellschaft. Installation for the protection of motor vehicle bodies against lateral impacts. 3,887,227, Cl. 296-28.00R.

Deeks, Ronald G., to Procor Limited. Gas vent. 3,886,978, Cl. 138-103.000.

De Feo, Angelo; and Price, Harry N., to Curtiss-Wright Corporation. Bidirectional planetary gear transmission. 3,886,816, Cl. 74-764.000.

DeFeo, Richard J.: *See*—
Long, Robert B.; Caruso, Fred A.; DeFeo, Richard J.; and Walker, David G., 3,887,600.

Degn, Hans Peter: *See*—
Lundsgaard, Jorgen Schjerning; and Degn, Hans Peter, 3,886,971.

de Graaf, Wilhelmus Polycarpus; In'T Veld, Jan Man; and Vervaart, Adrianus Petrus, to U.S. Philips Corporation. Glow discharge starter switch. 3,887,847, Cl. 317-15.000.

DeHoff, Edward J.; and Flory, Donald M., to General Motors Corporation. Disc brake caliper assembly and method. 3,887,045, Cl. 188-73.300.

Deiner, Hans, to Ciba-Geigy AG. Concentrated stable aqueous emulsions of water-repellent agents and process for making them. 3,887,390, Cl. 106-271.000.

Del Mar Engineering Laboratories: *See*—
Gregg, David Paul, 3,887,787.

del Castillo, Juan M. Optical metronome. 3,886,839, Cl. 84-484.000.

Del Faro, Gordon P.; and Valentine, Eugene E. Machine tool monitoring unit. 3,887,052, Cl. 192-127.000.

Del Guercio, Louis R. M.: *See*—
Szabo, Anthony W.; and Del Guercio, Louis R. M., 3,886,938.

Deman, Albert: *See*—
Diebel, Howard; and Deman, Albert, 3,886,958.

DeMets, Albert, to Bison-werke Bahre & Greten GmbH & Co. Kg. Continuously operating press. 3,887,318, Cl. 425-371.000.

Demou, John G.; and Cenker, Moses, to BASF Wyandotte Corporation. Preparation of low density flexible urethane foams with enhanced load-bearing properties. 3,887,505, Cl. 260-2.5AB.

Denoor, Gaston, to B.V.S. Prefabricated element for wall construction. 3,886,752, Cl. 61-45.00R.

Dentsply Research & Development Corp.: *See*—
Thornton, Henry M., Jr.; and Plowman, Richard E., 3,886,660.

Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Derivatives of pyrazolo(3,4-b)thieno(2,3-d)pyridine-2-carboxylic acids. 3,887,570, Cl. 260-294.80B.

Derivados del Fluor, S.A.: *See*—
Escribano Nevado, Antonio; Chapela Lago, Eduardo; and Gutierrez Hernandez, Jesus, 3,887,693.

Desalination Systems, Inc.: *See*—
Bray, Donald T., 3,887,463.
Bray, Donald T., 3,887,468.

Descamps, Freddy Francois Eugene; Dumont, Georges Luciaan; and Goossens, Walter Remi Adele, to Studiecentrum Voor Kernenergie SCK. Fluidization column. 3,887,337, Cl. 23-284.000.

Deshayes, Phillippe M.; and Weber, Guy Paul, to La Cellophane. Apparatus for developing a latent charged image. 3,886,900, Cl. 118-637.000.

Deuter, Thomas F., to General Electric Company. Process of making a dynamoelectric machine structure by pressure molding. 3,887,677, Cl. 264-272.000.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Schreyer, Gerd; Theissen, Ferdinand; Weiberg, Otto; and Weigert, Wolfgang, 3,887,490.

Thurn, Friedrich Martin; Meyer-Simon, Eugen; Will, Werner; Schmidt, Franz; Schenk, Wolfgang; and Wurmb, Rolf, 3,887,602.

Deutsche Texaco Aktiengesellschaft: *See—*
Strehlke, Gunter; Franz, Wilhelm; and Osterburg, Gunter, 3,887,609.

DeVincentiis, Girolamo; and Luvison, Angelo, to CSELT-Centro Studi E Laboratori Telecomunicazioni s.p.a. Generator of pulse trains corresponding to walsh functions. 3,887,798, Cl. 235-152.000.

Devlin, Bernard T., to Sperry Rand Corporation. Aircraft glide slope coupler and landing system. 3,887,148, Cl. 244-77.00A.

Diakides, Nicholas A., to United States of America, Army. Method of making high contrast fiber optic phosphor screen. 3,887,724, Cl. 427-64.000.

Diamond Shamrock Corporation: *See—*
Battershell, Robert D.; Bimber, Russell M.; and Bungs, Janis A., 3,887,657.
Beckers, Norman L., 3,887,628.

Diamontis, Damon. Folding crutch. 3,886,962, Cl. 135-49.000.

Diaz, Juan C.; and Edwards, Ray, to Eastman Kodak Company. Extrusion coating composition containing ethylenepropylene block copolymer and polyethylene having a MIR of at least 50. 3,887,640, Cl. 260-876.00B.

Di Blasi, Rosario. Collapsible vehicle. 3,887,218, Cl. 280-278.000.

Dickhudt, Eugene A.: *See—*
Bolduc, Lee R.; and Dickhudt, Eugene A., 3,887,112.

Didier-Werke AG: *See—*
Fehling, Hans Reinhard, 3,887,117.

Diebel, Howard; and Deman, Albert, to Moyer Diebel Limited. Apparatus for washing articles. 3,886,958, Cl. 134-80.000.

Dieckmann, Dale J., to Dart Industries Inc. Vinyl halide stabilizer compositions of antimony organic sulfur-containing compounds and metal carboxylates. 3,887,508, Cl. 260-23.0XA.

Dietz, Richard E., to Phillips Petroleum Company. Olefin polymerization catalyst. 3,887,494, Cl. 252-452.000.

DiGuilio, Guy, to Sperry Rand Corporation. Plated wire memory. 3,887,338, Cl. 29-191.600.

Dinkel, Emil, to Metallwerk Max Brose & Co. Hinge arrangement for a folding car seat. 3,887,232, Cl. 297-367.000.

Ditlinger, Richard J.; Kerr, Richard W.; and Massing, Lyle E., to Bendix Corporation, The. Piston and extensible cylinder therefor. 3,887,042, Cl. 188-71.800.

Diwo, Manfred. Double flask for the reception of two liquids. 3,887,069, Cl. 206-229.000.

Dixon, William D., to Monsanto Company. Process for the preparation of 2-imino derivatives of substituted imidazoles. 3,887,577, Cl. 260-309.600.

Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See—*
Bez, Ulrich, 3,887,223.

Dokes, Samuel; and Isaiah, Alvin K., to Plotkin, Steven R.; and Gertler, David, part interest to each. Fire extinguisher. 3,887,011, Cl. 169-69.000.

Dolfini, Joseph E.: *See—*
Perrella, Donald J.; and Dolfini, Joseph E., 3,887,542.

Dolinski, Richard J.: *See—*
Cornier, Sally P.; Tefertiller, Ben A.; and Dolinski, Richard J., 3,887,496.

Donaldson, Ralph W., Jr.: *See—*
Pollock, Glenn E.; Henderson, Milton E.; and Donaldson, Ralph W., Jr., 3,887,345.

Doniat, Denis; Beccu, Klaus; and Porta, Augusto, to Battelle Memorial Institute S.A. Automobiles Citroen. Method and apparatus for electrochemically producing an electric current. 3,887,400, Cl. 136-86.00A.

Dorer, Wilfried, to Addressograph-Multigraph Corporation. Envelope stuffing machine. 3,886,715, Cl. 53-384.000.

Dorfman, Gersh Abramovich: *See—*
Kulakov, Nikolai Konstantinovich; Likhogub, Evgeny Petrovich; Dorfman, Gersh Abramovich; and Suslov, Alexandr Nikolaevich, 3,887,438.

Dorgebray, Gerard. Plug for pipes under pressure. 3,886,977, Cl. 138-89.000.

Doty, Bruce Ivan. Heat-massage device for physical therapy. 3,886,934, Cl. 128-24.100.

Douglas, Frank C.; Galasso, Francis S.; and Whittier, James Y., to United Aircraft Corporation. Method for producing a plurality of filaments in a radio frequency reactor. 3,887,722, Cl. 427-46.000.

Douros, John D., Jr.: *See—*
Kerst, Al F.; and Douros, John D., Jr., 3,887,353.

Dow Chemical Company, The: *See—*
Cornier, Sally P.; Tefertiller, Ben A.; and Dolinski, Richard J., 3,887,496.
Jones, Elvis E.; Mays, William A.; and Smith, William F., 3,886,963.
Lagess, Thomas F.; and Maudlin, Valroy Henry, 3,887,462.
Nelson, David A., 3,887,512.
Pennington, Donald W.; and Enos, James H., 3,887,515.
Pitts, Charles A., 3,887,006.
Ramirez, Enrique Garcia; Thomas, Lowell Curtis; and Fry, William Earl, 3,887,491.
Torney, Harry L.; Torney, Helen T.; and Bordt, Dale E., 3,887,430.

Dow Corning Corporation: *See—*
Butler, Anthony J.; and Pail, Daniel R., 3,887,758.

Dow Corning Limited: *See—*
Chandra, Grish, 3,887,599.

Draber, Wilfried; Buchel, Karl Heinz; Regel, Erik; and Plempel, Manfred, to Bayer Aktiengesellschaft. Antimycotic diphenyl-imidazolyl-pyrimidyl methanes. 3,887,556, Cl. 260-256.40R.

Dransch, Gunther; Hartel, Kurt; Horlein, Gerhard; Schonowsky, Hubert; and Studeneer, Adolf, to Hoechst Aktiengesellschaft. Substituted phenyl-carbamoyl-alkyl carbonylamino-benzimidazoles. 3,887,576, Cl. 260-309.200.

Dresser Industries, Inc.: *See—*
Abney, David Lewis; and Williams, Robert Carl, 3,887,007.
Wishon, Berhl E., 3,887,173.

Drummond, William E.; and Sloan, Millard L., to Aralco. Autoresonant acceleration of ions. 3,887,832, Cl. 315-5.410.

DSO "Bulgarski Darjavni Jeleznitzi": *See—*
Stanev, Tzvyatko Penchev, 3,887,022.

Duane, John J.; and Lindner, Charles B., to Union Carbide Corporation. Diaper insert. 3,886,941, Cl. 128-287.000.

Duckett, John C.; Easley, Wayne W.; and Wickham, William T., to Dayco Corporation. Compressible printing blanket. 3,887,750, Cl. 428-297.000.

Duikers, Marcel: *See—*
Michel, Edmond; and Duikers, Marcel, 3,886,824.

Dumont, Georges Luciaan: *See—*
Descamps, Freddy Francois Eugene; Dumont, Georges Luciaan; and Goossens, Walter Remi Adele, 3,887,337.

Duncan, Jerry E.; and Riggin, Lance E., to United States of America, Navy. Pulse amplitude modulation, frequency modulation telemetric data transmitter. 3,887,873, Cl. 325-113.000.

Dunlop Limited: *See—*
Malone, Denis Frederick, 3,887,041.

Dunn, Troy. Play crib. 3,886,607, Cl. 5-104.000.

Dunn, Wendell E., Jr., to Titanium Technology N.V. Production of chlorine. 3,887,694, Cl. 423-500.000.

Duo-Fast Corporation: *See—*
Obergfell, Allen R., 3,887,113.

du Pont de Nemours, E. I., and Company: *See—*
Bellettini, Arturo Gabriel; and Franklin, Richard Crawford, 3,887,540.
Faulhaber, Mark Edwin, 3,887,814.
Irwin, Carl F., 3,887,167.
Polss, Perry, 3,887,621.

Dupre, Jacques-Philippe. Face mask and process for making face masks. 3,886,597, Cl. 2-206.000.

Durham, Donald F.: *See—*
Engelking, Frederick S.; and Durham, Donald F., 3,887,200.

Dwyer, Thomas J., to Corning Glass Works. Thin-walled honeycombed substrate with axial discontinuities in the periphery. 3,887,741, Cl. 428-188.000.

Dymo Industries, Inc.: *See—*
Chazan, David J., 3,887,734.

Dynachem Corporation: *See—*
Gilano, Michael N.; Beaupre, Richard E.; and Lipson, Melvin A., 3,887,450.

Dynamit Nobel AG: *See—*
Looman, Wolfgang; Pungs, Wolfgang; Bierwirth, Egon; and Buning, Robert, 3,887,728.

Dynamit Nobel Aktiengesellschaft: *See—*
Krah, Robert; and Gehrke, Alfons, 3,886,709.

E. R. Squibb & Sons, Inc.: *See—*
Breuer, Hermann; and Treuner, Uwe D., 3,887,573.
Denzel, Theodor; and Hoehn, Hans, 3,887,570.
Hunger, Gerd, 3,886,940.
Lee, Bong Kuk; Neidleman, Saul Lewis; and Ryu, Dewey D. Y., 3,887,546.
Perrella, Donald J.; and Dolfini, Joseph E., 3,887,542.
Vogt, Berthold Richard, 3,887,544.

Eadie, Gordon Cunningham, to British Steel Corporation. Process for producing alkaline earth ferrites. 3,887,478, Cl. 252-62.630.

Eagle-Picher Industries, Inc.: *See—*
Perry, Gary D., 3,887,216.

Earley, Donald C. Ventilated, adjustable size, open top receptacle. 3,887,102, Cl. 220-8.000.

Easley, Wayne W.: *See—*
Duckett, John C.; Easley, Wayne W.; and Wickham, William T., 3,887,750.

Eastman Kodak Company: *See—*
Bailey, David S., 3,887,372.
Bresson, Richard J., 3,887,930.
Brongo, Ralph T.; Fleming, James C.; and Manthey, Joseph W., 3,887,374.
Diaz, Juan C.; and Edwards, Ray, 3,887,640.
Ettischer, Helmut, 3,887,934.
Hunt, Robert W. G., 3,887,939.
Poignant, Robert V., Jr.; and Przybylowicz, Edwin P., 3,887,807.
Tepper, Charles William, 3,887,277.
Wilson, Burton D.; Woodgate, Paul E.; and Henn, Richard W., 3,887,376.

Easton, Wayne B. High pressure expansible chamber device. 3,887,309, Cl. 418-61.00B.

Eastwood, Thomas, to David Brown Tractors Limited. Multi-speed reversible gearing. 3,886,815, Cl. 74-745.000.

Eaton Corp.: *See—*
Baremor, Jerry F., 3,886,813.
Bernhardt, Thomas Joseph; and Klein, Frank N., 3,887,860.
Brawn, Darrell S., 3,887,214.
Brundige, Clayton L.; and Bechman, William H., 3,887,098.
Goetz, George W., 3,887,213.

Klein, Frank N.; and O'Callaghan, Gerald F., 3,887,853.
Obermaier, Frank E.; and Scott, Arthur A., 3,887,159.
Ward, Harold R., 3,886,741.

Eblovi, Roger, to General Signal Corporation. Automatic vehicle protection system. 3,887,152, Cl. 246-37.000.

Eckert, George W.: *See—*
Lachowicz, Donald R.; Saines, George S.; and Eckert, George W., 3,887,593.

Economic Development Corporation: *See—*
McLaughlin, Minor E., 3,887,459.

Economics, Laboratory, Inc.: *See—*
Rue, Larry M.; Freis, Richard E.; and Ossanna, Oliver A., 3,887,480.

Edmund, James Mitchell. Safety ski binding. 3,887,205, Cl. 280-11.35K.

Edwards, Ray: *See—*
Diaz, Juan C.; and Edwards, Ray, 3,887,640.

Edwards, Thomas C., to Rovac Corporation, The. Self-driven refrigerator. 3,886,763, Cl. 62-402.000.

Edwards, Thomas C., to Rovac Corporation, The. Compressor-expander having tilting vanes for use in air conditioning. 3,886,764, Cl. 62-402.000.

Edwards, Thomas C., to Rovac Corporation, The. Compressor-expander having thermal isolation and adjustment features. 3,886,765, Cl. 62-402.000.

Egli, Rene: *See—*
Schmid, Eduard; Nascher, Reinold; Egli, Rene; Parratt, Noel James; and Gooding, Ronald William, 3,887,429.

Egyptien, Josef; and Henning, Walter, to Messrs. Jos. Zimmermann. Textile treatment tube. 3,887,145, Cl. 242-125.100.

Ehmann, Wolfgang: *See—*
Olsen, Willi; Lieske, Manfred; Ehmann, Wolfgang; and Perst, Gerhard, 3,887,915.

Eicke, Hans; Arnold, Vladimir; and L'Eplattenier, Francois, to Ciba-Geigy Corporation. Process for the manufacture of metal complexes in a pure form. 3,887,598, Cl. 260-429.00R.

Eiken Chemical Co., Ltd.: *See—*
Takase, Kazuei; and Morikawa, Junji, 3,887,332.

Eikenberg, Dieter: *See—*
Burgdorf, Jochen; and Eikenberg, Dieter, 3,887,044.

Ejiri, Masakazu: *See—*
Uno, Takeshi; Yoda, Haruo; Ejiri, Masakazu; Mese, Michihiro; and Ikeda, Sadahiro, 3,887,762.

Elbe, Maximo, to Colorant Schmuckstein GmbH. Method for grinding a gem stone. 3,886,695, Cl. 51-283.000.

Elbert, Ketil E. Method and apparatus for boring drain holes in ground. 3,887,021, Cl. 175-422.000.

Elbling, Joseph, to Inductosyn Corporation. Measuring apparatus for machine tool systems. 3,887,857, Cl. 318-572.000.

Eldre Components, Inc.: *See—*
Erdle, Harvey B., 3,886,654.

Electrac, Inc.: *See—*
Katz, Louis; and Wells, Lawrence, 3,887,794.

Electronic Memories & Magnetics Corp.: *See—*
Krag, Niels, 3,887,904.

Elgin Sweeper Company: *See—*
Landesman, Eric; and Palmiter, Donald R., 3,886,623.
Landesman, Eric; and Palmiter, Donald R., 3,886,624.

Eli Lilly and Company: *See—*
Jones, William E.; and Cullinan, George J., 3,887,565.
Shields, James E.; and Smithwick, Edward L., Jr., 3,887,538.
Tao, Eddie Vi Ping, 3,887,572.
Taylor, Harold M.; Davenport, James D.; and Hackler, Ronald E., 3,887,708.
Williams, Robert H.; Hoehn, Marvin M.; and Michel, Karl-Heinz, 3,887,433.
Williams, Robert H.; Hoehn, Marvin M.; and Michel, Karl-Heinz, 3,887,564.

Eliason, Kay E., to Atlantic Richfield Company. Pipeline insulation means. 3,886,981, Cl. 138-149.000.

Elizer, Lee H., to Hubinger Company, The. Textile treatment with amphoteric starch esters. 3,887,752, Cl. 428-378.000.

Elkem-Spigerverket A/S: *See—*
Enger, Rolf; Piene, Kristian; Skreien, Nils; Saethre, Audun; and Thorslund, Jan-Erik, 3,887,359.

Ellis, Gwynn Pennant; and Peel, Mervyn Evan, to Allen & Hanburys Limited. Carboxamido tetrazolo chromones. 3,887,574, Cl. 260-308.00D.

Ellis, John L.; Mal, M. Kumar; and Tarkan, Stuart E., to Chromalloy American Corporation. Method of producing heat treatable titanium carbide tool steel coatings on cylinders of internal combustion engines. 3,886,637, Cl. 29-156.4WL.

Ellis, Robert P. Bicycle operating means. 3,886,807, Cl. 74-521.000.

Elmendorf, Armin; and Etzold, Roland, to Elmendorf Research, Inc. Panel with decorative bark surface and method of making the same. 3,887,415, Cl. 156-154.000.

Elmendorf Research, Inc.: *See—*
Elmendorf, Armin; and Etzold, Roland, 3,887,415.

Elmo Company, Limited: *See—*
Kachi, Kenjiro; Takeichi, Morio; Nakamura, Yasumasa; Inomata, Yoichi; and Nakano, Mitsuru, 3,887,274.

Elser, Wolfgang; and Schwantje, Gerd, to BASF Aktiengesellschaft. Process for the production of 1-amino-4-nitroanthraquinone-2-carboxylic esters. 3,887,591, Cl. 260-376.000.

Elson, Arthur M., to Acme-Hamilton Manufacturing Corporation. Steam hose design. 3,886,980, Cl. 138-127.000.

Eltee Pulsitron (Entire): *See—*
Wohlabaugh, Leonard M., 3,887,782.

Elworthy and Company Ltd: *See—*
Gunn, John Wolferston; and Murphy, Leonard Adolphus, 3,886,833.

Emco Limited: *See—*
Anderson, Leslie T., 3,887,136.

Emerick, Carl M.: *See—*
Holub, Fred F.; and Emerick, Carl M., 3,887,582.

Emery, Edgar Frank, to Manx Mail Order Limited. Cable tie clips. 3,886,630, Cl. 24-16.0PB.

Emery Industries, Inc.: *See—*
Yau, Chiou C.; Schlossman, Irwin S.; and Oehlschlaeger, Herman F., 3,887,523.

Emporium Specialties Co., Inc.: *See—*
Bignell, Fred A., 3,887,051.

Endo, Ichiro: *See—*
Matsuno, Hiroshi; and Endo, Ichiro, 3,887,369.

Endo, Kazuo: *See—*
Inomata, Jihei; Hayashi, Masahiro; Nozawa, Seiichi; Ota, Takayuki; Endo, Kazuo; and Yamaguchi, Yukio, 3,887,651.

Engel, Henry L., to Caterpillar Tractor Co. Tree harvester shear assembly with fixed and movable blades. 3,886,984, Cl. 144-3.00D.

Engel Industries, Inc.: *See—*
McClain, Lamont R., 3,886,779.

Engelhard Minerals & Chemicals Corporation: *See—*
Nesteruk, Edward P., 3,887,383.

Engelking, Frederick S.; and Durham, Donald F., to Caterpillar Tractor Co. Rotary seal assembly. 3,887,200, Cl. 277-88.000.

Enger, Rolf; Piene, Kristian; Skreien, Nils; Saethre, Audun; and Thorslund, Jan-Erik, to Elkem-Spigerverket A/S. Reduction of silicon dioxide by means of carbon in electric furnace. 3,887,359, Cl. 75-11.000.

Engle, Thomas H., to General Signal Corporation. Method and apparatus for controlling the speed of a vehicle. 3,887,239, Cl. 303-21.00B.

Enos, James H.: *See—*
Pennington, Donald W.; and Enos, James H., 3,887,515.

Environment/One Corp.: *See—*
Peters, Philip H., Jr., 3,887,781.

Environmental Metrology Corp.: *See—*
Swigert, David L., 3,887,908.

Environmental Research & Technology, Inc.: *See—*
Blau, Henry H., Jr.; and Kebabian, Paul L., 3,887,262.

Erdle, Harvey B., to Eldre Components, Inc. Method of manufacturing laminated bus bars. 3,886,654, Cl. 29-624.000.

Erdman, Lynn Ellynn. Chemical thermal package with three separate chambers. 3,887,346, Cl. 62-4.000.

Erickson, Alve John: *See—*
Mix, Thomas William; and Erickson, Alve John, 3,887,665.

Erickson Tool Company: *See—*
Benjamin, Milton L.; and Miles, Wilbur N., 3,887,203.

Erlewine, Richard H.; Richter, Charles W., III; and Calpha, Arthur J., Jr., to General Plastics Corporation. Apparatus for continuously forming plastic sheet and corrugating with vacuum pressure. 3,887,320, Cl. 425-384.000.

Ernst, Arnold E. Planter apparatus. 3,886,875, Cl. 111-85.000.

Escribano Nevado, Antonio; Chapela Lago, Eduardo; and Gutierrez Hernandez, Jesus, to Derivados del Fluor, S.A. Continuous process for obtaining aluminium fluoride by reacting fluosilicic acid with an aluminous material. 3,887,693, Cl. 423-489.000.

Esper, Michael J.: *See—*
Stadler, Henry L.; Tien, Tseng-ying; Esper, Michael J.; and Romine, Donald J., 3,886,785.

Essex Engineering Works (Wanstead) Limited: *See—*
Allen, Kenneth Rinaldo, 3,887,054.

Essilor International: *See—*
Godot, Jean-Marie, 3,886,691.

Essilor International (Compagnie Generale d'Optique): *See—*
Godot, Jean-Marie, 3,886,692.

Establissements Nativelle S.A.: *See—*
Adembri, Giorgio; Tedeschi, Piero; Ponticelli, Fabio; and Marini, Maresco, 3,887,578.

Ethyl Corporation: *See—*
Kobetz, Paul, 3,887,691.

Ettischer, Helmut, to Eastman Kodak Company. Photographic shutter. 3,887,934, Cl. 354-251.000.

Etzold, Roland: *See—*
Elmendorf, Armin; and Etzold, Roland, 3,887,415.

Evanega, George R.; Kuhla, Donald E.; and Sarges, Reinhard, to Pfizer Inc. Piperidinesulfonylurea derivatives. 3,887,561, Cl. 260-283.0SA.

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Glaus, Bernhard Max; Maag, Guido; and Knus, Hermann, to Ulrich Steinemann AG Maschinenfabrik. Apparatus for stacking loosely adjacent articles. 3,887,087, Cl. 214-6.0DK.

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Glennon, Timothy F., to Sunstrand Corporation. Paralleling control for phase synchronized generators. 3,887,820, Cl. 307-87.000.

Global Marine Inc.: *See*—
Anders, Edward Olen, 3,886,886.
Thornburg, Russell B.; and Jones, Klemme M., 3,886,882.

Glomm, Horst: *See*—
Reed, Robert D.; Zink, John Smith; Schwartz, Robert F.; Glomm, Horst; Corble, John C.; and Koons, Harold F., 3,887,324.

Glory Kogyo Kabushiki Kaisha: *See*—
Ushio, Masatoshi, 3,886,957.

Go, Tadahiro; and Yamato, Motoyuki, to Nippon Zeon Co., Ltd. Polymer oils and process for preparing same. 3,887,633, Cl. 260-683.900.

Godot, Jean-Marie, to Essilor International. Machine for trimming and bevelling ophthalmic lenses. 3,886,691, Cl. 51-101.0LG.

Godot, Jean-Marie, to Essilor International (Compagnie Generale d'Optique). Machines for trimming and bevelling ophtalmic lenses. 3,886,692, Cl. 51-101.0LG.

Goedert, Gerald Lawrence. Rotating bicycle signal and drive therefor. 3,887,900, Cl. 340-134.000.

Goetz, George W., to Eaton Corp. Inflatable vehicle occupant restraint and system therefor. 3,887,213, Cl. 280-150.0AB.

Goff, Raymond L.; and Rau, Jim L., to TRW Inc. Steering system. 3,887,028, Cl. 180-79.20R.

Goff, Richard E., Jr.: *See*—
Campbell, Roger G.; Goff, Richard E., Jr.; and Guay, Normand D., 3,886,598.

Golden, Gerald; and Kennedy, James D., to Beatrice Foods Company. Flashing reflector system. 3,887,268, Cl. 350-99.000.

Gonnella, Sebastian: *See*—
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Gontarek, Marvin D.: *See*—
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Gonzalez, David P.; and Peacock, Odette A., to Raymond Lee Organization, Inc., The. Radiator cap remover tool. 3,886,823, Cl. 81-175.000.

Goodale, Richard J. Apparatus for coring cauliflower heads. 3,886,857, Cl. 99-563.000.

Goodfinger, Frank Carl; and Tuhro, Richard H., to Computer Identics Corporation. Interstitial contrasting coded mark label reading system. 3,887,793, Cl. 235-61.11E.

Gooding, Ronald William: *See*—
Schmid, Eduard; Nascher, Reinold; Egli, Rene; Parratt, Noel James; and Gooding, Ronald William, 3,887,429.

Goodyear, Michael U.; Ezis, Andre; and Styhr, Karsten H., to Ford Motor Company. Making a triple density article of silicon nitride. 3,887,411, Cl. 156-89.000.

Goodyear, Michael U.: *See*—
Styhr, Karsten H.; Ezis, Andre; and Goodyear, Michael U., 3,887,412.

Goodyear Tire & Rubber Company, The: *See*—
Neubert, Terry C., 3,887,532.

Googin, John M.; and Schmitt, Charles R., to United States of America, Energy Research and Development Administration. Porous, microspheroidal, nuclear fuels having internal porosity. 3,887,486, Cl. 252-301.10R.

Goossens, Walter Remi Adele: *See*—
Descamps, Freddy Francois Eugene; Dumont, Georges Luciaan; and Goossens, Walter Remi Adele, 3,887,337.

Goralnik, Charles D. Wall-mounted lighting fixture. 3,887,802, Cl. 240-73.0LD.

Gore, Douglas Alan: *See*—
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Gore, Wilbert L., to W. L. Gore & Associates, Inc. Tape wrapped conductor. 3,887,761, Cl. 174-110.00R.

Gotsch, John M., Jr., to Gauer Metal Products, Inc. Cart. 3,887,207, Cl. 280-33.99T.

Gouye, Emmanual Victor, to United States of America, Environmental Protection Agency. Ascension pipe cleaning apparatus with self-indexing suspension. 3,886,694, Cl. 51-170.0PT.

Goyer, Ronald Bruce, to RCA Corporation. Correlator and control system for vehicular collision avoidance. 3,887,916, Cl. 343-6.5LC.

Graae, Johan E. A.; Jamrog, Aloysius R.; Kelecius, Anthony S.; and Mingesz, Donald P., to United States of America, Energy Research and Development Administration. Bearing mounting for telescoping tubes. 3,887,247, Cl. 308-6.00B.

Grace Machinery Company Incorporated: *See*—
Hinds, Horace, Jr., 3,887,718.

Grancio, Michael R.; and Walker, George E., to Monsanto Company. Lacquered articles of cold rolled ABS resin. 3,887,746, Cl. 428-215.000.

Green, Charles Donald: *See*—
Charlson, Paul Marlin; Green, Charles Donald; Harris, William John; and Inman, Keith Erwin, 3,887,106.

Green Giant Company: *See*—
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Gregg, David Paul, to Del Mar Engineering Laboratories. Dry process photographic paper recording apparatus. 3,887,787, Cl. 219-216.000.

Greune, Christian; Hackl, Friedrich; and Maier, Karl, to Motoren-und Turbinen-Union Munich GmbH. Governing device for a gas turbine system. 3,886,730, Cl. 60-39.28R.

Greune, Christian; and Hackl, Friedrich, to Motoren-und Turbinen-Union Munchen GmbH. Governing device for a gas turbine system. 3,886,731, Cl. 60-39.28T.

Gribovszki: *See*—
Tajnafoi, Jozsef; Gellert, Karoly; Hidasi, Karoly; Gribovszki; and Vekony, Sandor, 3,886,693.

Grieb, Hubert, to Motoren-und Turbinen-Union Munchen GmbH. Turbojet engines of multi-shaft and multi-flow construction. 3,886,737, Cl. 60-226.00R.

Grieb, Hubert, to Motoren-und Turbinen-Union Munchen GmbH. Apparatus and method for augmenting the lift of an aircraft having short take-off and landing capabilities. 3,887,147, Cl. 244-42.0CC.

Griffith, Frank S., to New Jersey Zinc Company, The. Removal of sulfur dioxide from waste gases. 3,887,684, Cl. 423-242.000.

Griffiths, David, to Friedemann, Conrad J. Speedometer optical projection system. 3,887,273, Cl. 353-14.000.

Grigorov, Simeon Alexandrov: *See*—
Julev, Stoyan Iliev; Milkov, Mihail Yordanov; Dachev, Lyubomir Petrov; Vassilev, Rossen Petrov; and Grigorov, Simeon Alexandrov, 3,887,424.

Grimmer, George G.: *See*—
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Groh, Dale L.: *See*—
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Groh, Gale A.: *See*—
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Groning, Uwe; and Luthgens, Uwe, to Messerschmitt-Bolkow-Blohm GmbH. Fastening means for passenger seats. 3,887,230, Cl. 297-232.000.

Grosseau, Albert, to Societe Anonyme Automobiles Citroen. Pulse repetition rate meters. 3,887,870, Cl. 324-78.00D.

Grossman, Paul R., to Q-Panel Company. Cyclic test apparatus. 3,886,791, Cl. 73-150.00R.

Grubbs, Harvey J.: *See*—
Rundberg, Eric G. S., Jr.; Johnson, William R., Jr.; and Grubbs, Harvey J., 3,887,603.

Gruett, Donald G., to Oil-Rite Corporation. Liquid level gauge. 3,886,796, Cl. 73-328.000.

Grushon, Harold N., to Monarch Marking Systems, Inc. Pinning machine. 3,887,107, Cl. 221-241.000.

GTE Sylvania Incorporated: *See*—
Halstead, Albert O., Jr.; and Hebbard, Donald A., 3,887,725.
MacInnis, Martin B.; Vanderpool, Clarence D.; and Boyer, Carl W., 3,887,680.

Guagliardo, Matthew: *See*—
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Guay, Normand D.: *See*—
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Guggenbuhl, Walter, to Contraves AG. Measuring device for determining the concentration and the mean particle size of particles suspended in an electrolytically conductive liquid. 3,887,868, Cl. 324-71.0CP.

Gunn, John Wolferston; and Murphy, Leonard Adolphus, to Elworthy and Company Ltd; and MacMillan Bloedel Limited. Apparatus to effect remote automatic positioning of web slitter. 3,886,833, Cl. 83-499.000.

Gural, John A.; and Moulds, John W., to General Motors Corporation. Carburetor. 3,887,662, Cl. 261-39.00A.

Gural, John A., to General Motors Corporation. Air valve carburetor. 3,887,663, Cl. 261-50.00A.

Guse, Otto, to Robert Bosch Verpackungsmaschinen G.m.b.H. Apparatus for sealing containers. 3,886,708, Cl. 53-329.000.

Gutehoffnungshutte Sterkade Aktiengesellschaft: *See*—
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Gutierrez Hernandez, Jesus: *See*—
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Hacker, David Solomon, to John Mohr & Sons. Gas burner. 3,887,134, Cl. 239-404.000.

Hackl, Friedrich: *See*—
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Haddad, Ihsan A.; and Arsenault, Alvin R., to Instrumentation Laboratory, Incorporated. Cell culturing system. 3,887,436, Cl. 195-142.000.

Hafner, Gunther, to Daimler-Benz Aktiengesellschaft. Electronic control system for the velocity of a machine element. 3,886,921, Cl. 123-139.00E.

Hageman, Carlton V.: *See*—
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Hagiwara Denki Kabushiki Kaisha: *See*—
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Haglund, Robert J., to General Motors Corporation. Rotary engine heat sensing arrangement. 3,886,912, Cl. 123-8.470.

Hakim Company Limited: *See*—
Hakim, Salomon, 3,886,948.

Hakim, Salomon, to Hakim Company Limited. Ventricular shunt having a variable pressure valve. 3,886,948, Cl. 128-350.00V.

Hall, George H. Wire saw. 3,886,926, Cl. 125-21.000.

Hall, Percy P. Hitch for trailers overhanging a car body. 3,887,220, Cl. 280-423.00R.

Halpin, Robert G.: *See*—
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Halstead, Albert O., Jr.; and Hebbard, Donald A., to GTE Sylvania Incorporated. Process for improving lumen maintenance of calcium halophosphate phosphors used in a fluorescent lamp. 3,887,725, Cl. 427-67.000.

Haluda, Raymond P.; and Nelson, Kenneth W., to Clark Equipment Company. Lubrication system for differentials. 3,887,037, Cl. 184-6.120.

Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Selective printing apparatus. 3,886,862, Cl. 101-109.000.

Hamm, Charles S.: *See*—
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Hammers, David E.: *See*—
Bailey, John S.; and Hammers, David E., 3,887,918.

Hammond, Harry H., to Hansen Manufacturing Company, The. Coupling with push-pull release. 3,887,222, Cl. 285-307.000.

Hamner, Glen P.; and Clem, Kenneth R., to Exxon Research and Engineering Company. Ebullating bed process for hydrotreatment of heavy crudes and residua. 3,887,455, Cl. 208-112.000.

Hancock, Donald C.: *See*—
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Hannema, Johannes Hermanus; and Hannema, Lena Touw Nio. Fire safety cigarette. 3,886,954, Cl. 131-175.000.

Hannema, Lena Touw Nio: *See*—
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Hannibal, Billy B., to Tecumseh Products Company. Compressor oil pump with filter. 3,887,035, Cl. 184-6.160.

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Hansen, Howard C., to Clark Equipment Company. Concave conic reflector. 3,887,282, Cl. 356-138.000.

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Hara, Kazuyuki: *See*—
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Harada, Tetsuya; and Yumoto, Tsunemasa, to Japan Synthetic Rubber Company Limited. Process for recovering fatty acids and/or rosin acids. 3,887,537, Cl. 260-97.600.

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Hardtmann, Guetz E., to Sandoz, Inc. Pharmacologically active tricyclic quinazolinones. 3,887,559, Cl. 260-256.40F.

Hardy, Albert L., to General Electric Company. Compactor brake. 3,886,859, Cl. 100-53.000.

Hardy, Donald F., to Dart Industries Inc. Work holder with fluid purge means. 3,886,891, Cl. 118-1.000.

Harless, Charles E.; and Taylor, Ward G., to United States of America, Energy Research and Development Administration. Bellows-forming apparatus. 3,886,777, Cl. 72-84.000.

Harnish, Eugene E.; and Horner, Richard F., to Bendix Corporation, The. Automatic brake adjuster and reset having extensionable feature. 3,887,047, Cl. 188-196.00R.

Harrill, John D., to Marvel Specialty Company, Inc. Hosiery handling method and apparatus. 3,887,120, Cl. 223-43.000.

Harris, Bert C.: *See*—
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Harris, Frank N. Mufflers. 3,887,032, Cl. 181-59.000.

Harris-Intertype Corporation: *See*—
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Harris, J. David: *See*—
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Harris, Joe F., to Harris, J. David. Bed device for moving patient. 3,886,605, Cl. 5-81.00R.

Harris, Michael R., to Phillips Petroleum Company. Cutting apparatus. 3,886,832, Cl. 83-308.000.

Harris, William John: *See*—
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Hart, Ralph Stewart. Trailer pull-out unit. 3,887,226, Cl. 296-26.000.

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Hartmann, Clinton S.: *See*—
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Harvey, Jack E. Bicycle rack. 3,887,075, Cl. 211-5.000.

Harwick, Duane H.; and McDaniel, Dwight W., to General Motors Corporation. Master cylinder assembly and reservoir for same. 3,886,747, Cl. 60-585.000.

Haslett, Glenn M.; and Reinsma, Harold L., to Caterpillar Tractor Co. Resilient mid-pitch lug for an endless track. 3,887,244, Cl. 305-57.000.

Hatebur Umformmaschinen AG: *See*—
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Hattingh, Pieter Anthon, to Bakke Industries Limited. Packaging arrangement. 3,887,123, Cl. 229-2.500.
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Hauserman, Inc.: *See*—
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Hayes, Fay A. Hand propelled swimming pool cleaner. 3,886,616, Cl. 15-1.700.
Hayes, John C., to Universal Oil Products Company. Preparation of amorphous alumina spheres. 3,887,492, Cl. 252-448.000.
Hayes, John C., to Universal Oil Products Company. Method of preparing spheroidal eta-alumina particles. 3,887,493, Cl. 252-448.000.
Hayman, Dennis J.; and Stultz, Robert George, to Hydrometals, Inc. Multi-way valve porting block. 3,886,638, Cl. 29-157.10R.
Haynes, Robert C. Recirculating fish raising tank system with cleanable filter. 3,886,902, Cl. 119-3.000.
Hays, Robert G.; Hughes, Henry G.; and Hunter, William L., to Motorola, Inc. Non-polluting photoresist developing process. 3,887,373, Cl. 96-36.000.
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Hedden, Jerry C., to PPG Industries, Inc. Fiber glass sizing for use in tire cord manufacturing. 3,887,389, Cl. 106-212.000.
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Hegar, Gert; Angliker, Hans-Joerg; Lang, Walter; Liechti, Hans Wilhelm; and Milicevic, Branimir, to Ciba-Geigy AG. Hexamethyl phosphotriamide-dye compositions. 3,887,329, Cl. 8-171.000.
Hein, Delton William, to American Cyanamid Company. Use of weak base resins as catalysts for the methylolation of acrylamide. 3,887,618, Cl. 260-561.00N.
Heindl, Friedrich, to Ludwig Engel KG. Injection unit for an injection moulding machine. 3,887,170, Cl. 259-191.000.
Heist, Kenneth D. Automatic slide music stand. 3,887,275, Cl. 353-74.000.
Helberg, Wilbur, to Tri-County Machine Products, Inc. Sod cutting and stacking machine. 3,887,013, Cl. 172-20.000.
Heldt, Karl Helge Konstantin, to SKF Industrial Trading & Development Company. Device for achieving an axially pre-stressed joint. 3,886,707, Cl. 52-758.00F.
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Heller, Rudolf, to Contraves AG. Apparatus for adjusting an optical observation device. 3,887,267, Cl. 350-85.000.
Hellestam, Carl-Johan Sigvard; Melkersson, Karl-Axel; and Nilsson, Rolf Olof, to Boliden Aktiebolag. Compositions for floridating drinking water. 3,887,482, Cl. 252-175.000.
Helmer, Karin Ulla Elisabet; and Reuterhall, Alf Ragnar, to Kemanord AB. Process for sizing cellulose fibers. 3,887,427, Cl. 162-158.000.
Helmich, Paul Otto Gunther: *See*—
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Henderson, Robert McDougall, to Colt Industries Operating Corp. Timing mechanism for breakerless ignition systems. 3,886,916, Cl. 123-117.00R.
Hendrix, Charles E., to United States of America, Navy. Radio-frequency holography. 3,887,923, Cl. 343-113.00R.
Henkel, Harry D., to General Motors Corporation. Radial compressor having improved press-fit pistons. 3,887,301, Cl. 417-53.000.
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Henrick, Clive A., to Zoecon Corporation. 2-Hydroxy or acetoxy substituted esters useful for the control of insects. 3,887,592, Cl. 260-399.000.
Henrick, Clive A., to Zoecon Corporation. 2-Chloro and alkoxy or alkylthio substituted esters useful for the control of insects. 3,887,594, Cl. 260-408.000.
Henrick, Clive A., to Zoecon Corporation. 2-Oxo substituted unsaturated esters useful for the control of insects. 3,887,596, Cl. 260-410.90R.
Hercules Incorporated: *See*—
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Hesener, Walter. Apparatus for playing an educational game including code orienting means. 3,886,672, Cl. 35-48.00R.
Hess, John R.; and Kozlin, Joseph R., to United Aircraft Corporation. Apparatus for sealing turbine blade damper cavities. 3,887,298, Cl. 416-220.000.
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Hester, Jackson B., Jr.; and Szmuszkovicz, Jacob, to Upjohn Company, The. 9H-Dibenzo[c, f]-s-triazolo[4,3-a]azepines. 3,887,575, Cl. 260-308.00R.
Hetzel, Max, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Magnetic parts and method of manufacturing same. 3,887,401, Cl. 148-121.000.
Hewitt, Robert L., to Terra Perma, Inc. Process of stabilizing soil and soil additive product. 3,887,506, Cl. 260-17.00A.
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Hijikata, Itsuo; Kasazaki, Masayoshi; and Terada, Hideto, to Sintokogio Ltd. Vacuum sealed molding apparatus. 3,887,321, Cl. 425-388.000.
Hills, Brian Andrew, to National Research Development Corporation. Decompression meter. 3,886,801, Cl. 73-432.00R.
Hillyer, Anthony William, to Raleigh Industries Limited. Epicyclic change speed hubs. 3,886,811, Cl. 74-750.00B.
Himmelbauer, Erich Eduard, to U.S. Philips Corporation. Cathode-ray tube having an electric cylinder lens for the dynamic correction of electrostatic deflection defocusing. 3,887,834, Cl. 315-31.00R.
Hinata, Masanao: *See*—
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Hirsch, Richard F. Automatic loading blind riveter. 3,886,783, Cl. 72-391.000.
Hirschfeld, Tomas, to Block Engineering, Inc. Method and apparatus for detecting and classifying nucleic acid particles. 3,887,812, Cl. 250-458.000.
Hitachi, Ltd.: *See*—
Akatsu, Toshio; and Fujiyoshi, Toshimitsu, 3,886,787.
Kawabe, Ushio; Kudo, Mitsuhiro; Fukase, Shigeo; and Ishibashi, Masato, 3,887,364.
Mannaka, Toshio; Kitanosono, Hidehiro; and Matsuka, Shigemichi, 3,887,452.
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Uno, Takeshi; Yoda, Haruo; Ejiri, Masakazu; Mese, Michihiro; and Ikeda, Sadahiro, 3,887,762.
Yamazaki, Eiichi, 3,887,833.
Hiwatashi, Yukinori: *See*—
Kumata, Seiji; Shimoi, Youichi; Hirabayashi, Terubika; and Hiwatashi, Yukinori, 3,887,682.

Hiyoshi, Teruo, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument capable of generating tone signals having the pitch frequency, tone color and volume envelope varied with time. 3,886,836, Cl. 84-1.260.

Hochiki Kabushiki Kaisha: *See—*
Kawakami, Mamoru, 3,887,815.

Hocq, Robert, to Societe Franco-Hispano-Americaine (FRANCIS-PAM. Key holder. 3,886,772, Cl. 70-456.00R.

Hodgdon, Russell B., Jr., to Ionics, Incorporated. Cation exchange membranes having carboxylic and sulfonic acid functionality. 3,887,499, Cl. 260-2.20R.

Hodgson, Brian, to Machine Tool Divisional Services Limited. Gear finishing machines. 3,886,845, Cl. 90-1.600.

Hoechst Aktiengesellschaft: *See—*
Blocker, Erich; Rupp, Walter; and Jakob, Franz, 3,887,521.
Cuntze, Ulrich; May, Adolf; and Milewski, Eckhard, 3,887,475.
Dransch, Gunther; Hartel, Kurt; Horlein, Gerhard; Schonowsky, Hubert; and Studeneer, Adolf, 3,887,576.
Fritze, Helmut; Hultzsch, Kurt; and Tietz, Hans-Jurgen, 3,887,513.
Marx, Gerhard; and Frank, Hermann, 3,887,809.
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Hoefke, Wolfgang: *See—*
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Hoehn, Hans: *See—*
Denzel, Theodor; and Hoehn, Hans, 3,887,570.

Hoehn, Marvin M.: *See—*
Williams, Robert H.; Hoehn, Marvin M.; and Michel, Karl-Heinz, 3,887,433.
Williams, Robert H.; Hoehn, Marvin M.; and Michel, Karl-Heinz, 3,887,564.

Hoey, Charles E., to Rohm and Haas Company. Method of forming permeable polymeric liner on absorbent diapers, wound dressings, catamenial pads and the like. 3,887,408, Cl. 156-78.000.

Hoffmann, Gunter Wilhelm; and Magnollay, Gilbert, to Werkzeugmaschinenfabrik Oerlikon-Buhrle. Pneumatic apparatus for firing an automatic firing weapon. 3,886,843, Cl. 89-136.000.

Hoffmann, Kurt, to American Micro-Systems, Inc. Low voltage CMOS amplifier. 3,887,881, Cl. 330-35.000.

Hoffmann-La Roche Inc.: *See—*
Archer, Giles Allen; and Sternbach, Leo Henryk, 3,887,604.
Bruderer, Hans; Richle, Rolf; and Ruegg, Rudolf, 3,887,548.
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,887,586.
Iacobelli, Jerome Anthony; Narwid, Thomas Albert; and Uskokovic, Milan Radoje, 3,887,545.
Keith, Dennis; and Weigele, Manfred, 3,887,615.

Hofgen, Gunter; and Poschadel, Werner, to International Standard Electric Corp. Instrument landing system with microwave course pattern transmission. 3,887,922, Cl. 343-108.00R.

Hofmann, Karl, to Robert Bosch G.m.b.H. Fuel injection arrangement. 3,887,140, Cl. 239-600.000.

Hofmann, Peter; and Rohringer, Peter, to Ciba-Geigy Corporation. Phosphorus containing reaction products. 3,887,654, Cl. 260-928.000.

Hoganas AB: *See—*
Cornland, Georg Valentin, 3,886,705.

Hoheisel, Peter-Matthias: *See—*
Albrecht, Wilhelm; Patzelt, Helmut; and Hoheisel, Peter-Matthias, 3,887,215.

Hollins, Jesse R. Motor vehicle equipment. 3,887,818, Cl. 307-10.0SB.

Holthoff, Helmut; and Pazderka, Cyril, to Friedrich Kocks, Firma. Cutting devices for subdividing moving elongated stocks. 3,886,830, Cl. 83-285.000.

Holub, Fred F.; and Emerick, Carl M., to General Electric Company. Bis-imide compositions. 3,887,582, Cl. 260-326.260.

Honeywell Inc.: *See—*
Horning, Robert J., 3,887,397.
Pinckaers, B. Hubert, 3,887,000.
Smart, David C., 3,887,289.

Honeywell Information Systems Italia: *See—*
Minnaja, Nicola, 3,887,906.

Honjo, Kazuo, to Ideki Co., Ltd. Method of producing powder composed of precisely spherical particles. 3,887,668, Cl. 264-14.000.

Honshu Paper Company, Ltd.: *See—*
Nakai, Susumu; and Matsumura, Hisashi, 3,886,629.

Hooper, Clive William: *See—*
Key, Kenneth Andrew; and Hooper, Clive William, 3,886,721.

Hopkins, Henry R. Portable modular materials distribution system. 3,887,061, Cl. 198-36.000.

Hoppesch, Joseph P.; Ward, Donald H.; and Tomashek, James R., to Borg-Warner Corporation. Null memory system for a gas analysis system. 3,886,786, Cl. 73-27.00R.

Hoppesch, Joseph P.; Ward, Donald H.; and Tomashek, James R., to Borg-Warner Corporation. Breath tester null memory system. 3,886,929, Cl. 128-2.00C.

Hori, Kikuo; Okada, Hidehiko; and Fujita, Masakazu, to Teijin Limited. Process for producing polyester textured yarn. 3,886,722, Cl. 57-157.0TS.

Horlein, Gerhard: *See—*
Dransch, Gunther; Hartel, Kurt; Horlein, Gerhard; Schonowsky, Hubert; and Studeneer, Adolf, 3,887,576.

Horner, Richard F.: *See—*
Harnish, Eugene E.; and Horner, Richard F., 3,887,047.

Horning, Robert J., to Honeywell Inc. Highly conductive stable electrolyte for lithium batteries. 3,887,397, Cl. 136-6.0LN.

Horowitz, Noah, to Century Data Systems, Inc., A Division of California Computer Products, Inc. Tape speed compensation system. 3,887,942, Cl. 360-51.000.

Horst, Thomas A., to Western Sales and Supply Co. Tubular buffer element. 3,886,622, Cl. 15-230.130.

Horvath, Richard J., to Shell Oil Company. Sulfur-hydrocarbon slurry pipeline transportation containing an inorganic corrosion inhibitor. 3,887,330, Cl. 21-2.50R.

Hoshi, Hiroshi: *See—*
Susuki, Rinnosuke; Hoshi, Hiroshi; Yoshida, Minoru; Toyoda, Toshisaburo; Nakamura, Masayoshi; and Ando, Susumu, 3,887,614.

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House, Ralph: *See—*
Sweeney, William A.; and House, Ralph, 3,887,611.

Houtsager, Hendrik, to Moore Dry Kiln Company of Oregon. Automatic board turner. 3,887,066, Cl. 198-285.000.

Howard, Bernard H.: *See—*
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Howard, Dean D.; and Cross, David C., to United States of America, Navy. Digital radar target imaging with high radar resolution monopulse radar. 3,887,917, Cl. 343-7.900.

Howard, Thomas B.: *See—*
Christensen, James L.; and Howard, Thomas B., 3,887,919.

Howell, Gerald D. Boat trailer. 3,887,093, Cl. 214-84.000.

Hsu, Yuan Tsun; and Lange, K. Robert, to Betz Laboratories, Inc. Method for scrubbing gases derived from basic oxygen furnaces. 3,887,340, Cl. 55-72.000.

Hubinger Company, The: *See—*
Elizer, Lee H., 3,887,752.

Hubner, Klaus, to Siemens Aktiengesellschaft. Self-commutating frequency converter with additional charging arrangement. 3,887,859, Cl. 321-5.000.

Hubner, Klaus, to Siemens Aktiengesellschaft. Auxiliary extinguishing arrangement for the inverters in an intermediate link converter. 3,887,862, Cl. 321-45.00C.

Hudgin, Donald E.; and Reich, Murray, to Princeton Chemical Research, Inc. Degradable plastic. 3,886,683, Cl. 47-9.000.

Hudson, David Ian, to Raleigh Industries Limited. End stop for a forming machine. 3,886,776, Cl. 72-71.000.

Hudson, James L.; and Jordan, Larry L., to General Motors Corporation. Method of masking semiconductor wafers using a self-aligning mask. 3,887,421, Cl. 156-280.000.

Hughes, Henry G.: *See—*
Hays, Robert G.; Hughes, Henry G.; and Hunter, William L., 3,887,373.

Hughes, Mack F., to Chevron Research Company. Liquid phosphoric acid catalyzed polymerization process. 3,887,634, Cl. 260-683.15C.

Hughes, William B.; and Fahey, Darryl R., to Phillips Petroleum Company. Electro-chemical synthesis of organonickel compounds. 3,887,441, Cl. 204-59.0QM.

Hugonnier, Charles. Exterior driving mirror for an automobile vehicle. 3,887,156, Cl. 248-475.00A.

Hulse, Charles O.; and Batt, John A., to United Aircraft Corporation. Tough refractory oxide eutectic article. 3,887,384, Cl. 106-57.000.

Hultzsch, Kurt: *See—*
Fritze, Helmut; Hultzsch, Kurt; and Tietz, Hans-Jurgen, 3,887,513.

Humphries, Gillian K.: *See—*
McConnell, Harden M.; and Humphries, Gillian K., 3,887,698.

Hunger, Gerd, to E. R. Squibb & Sons, Inc. Capsule. 3,886,940, Cl. 128-271.000.

Hunt, Robert W. G., to Eastman Kodak Company. Scanning apparatus and method using sharp and unsharp spots. 3,887,939, Cl. 358-75.000.

Hunter, Bruce H.: *See—*
Hutchinson, Bruce R.; Hunter, Bruce H.; and Brooks, Robert H., 3,887,336.

Hunter, William L.: *See—*
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Huntington Institute of Applied Medical Research: *See—*
Shelden, Charles Hunter, 3,886,610.

Hurst, Eric Kenneth; and Moore, Ronald Keith, to Lewis Woolf Gripptight Limited. Baby soother. 3,886,949, Cl. 128-360.000.

Huston, Alexander Edward, to John Hadland Photographic Instrumentation Ltd. High speed camera. 3,887,841, Cl. 315-391.000.

Hutchinson, Bruce R.; Hunter, Bruce H.; and Brooks, Robert H. Incineration systems and methods. 3,887,336, Cl. 23-277.00C.

Hutchinson, William M., to Phillips Petroleum Company. Separation of fluorinated dimethyl ethers by extractive distillation. 3,887,439, Cl. 203-63.000.

Hutchison, John W.: *See—*
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Huttermann, Bernhard: *See—*
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Hyde, Vernon E. Trachea instrument. 3,886,946, Cl. 128-305.000.

Hydrometals, Inc.: *See—*
Hayman, Dennis J.; and Stultz, Robert George, 3,886,638.

Hyper-Loop, Inc.: *See—*
Sommeria, Marcel R., 3,887,122.

Iacobelli, Jerome Anthony; Narwid, Thomas Albert; and Uskokovic, Milan Radoje, to Hoffmann-La Roche Inc. Synthesis of 1α-hydroxylated cholesterol derivatives. 3,887,545, Cl. 260-239.55R.

Iarocci, Anthony; and Willows, William John, to Koehring Canada Limited. Multiple tree harvester and method for harvesting trees. 3,886,985, Cl. 144-309.0AC.
Ichikawa, Masaru; and Noguchi, Tamio, to Sagami Chemical Research Center. Process for preparing poly-1,4-trans butadiene. 3,887,536, Cl. 260-94.200.
Ichioka, Satoshi, to Mishima Kosan Co., Ltd. Method of manufacturing a continuous magnetic foil by electrodeposition. 3,887,440, Cl. 204-13.000.
Ideal Toy Corporation: *See—*
Ieda, Michael; and Ventura, Frank, 3,886,682.
Ideki Co., Ltd.: *See—*
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Ieda, Michael; and Ventura, Frank, to Ideal Toy Corporation. Toy vehicle and launcher. 3,886,682, Cl. 46-202.000.
Ihlingen, Horb: *See—*
Plocher, Werner; Ihlingen, Horb; Kuhl, Franz; and Huttermann, Bernhard, 3,887,317.
Ikeda, Hiroshi; Matsubara, Yukio; and Yamaguchi, Ginichi, to Onahama Seiren Kabushiki Kaisha. Conveyance of electrodes for electrolytic cells in electrorefining. 3,887,094, Cl. 214-89.000.
Ikeda, Sadahiro: *See—*
Uno, Takeshi; Yoda, Haruo; Ejiri, Masakazu; Mese, Michihiro; and Ikeda, Sadahiro, 3,887,762.
Illinois Tool Works Limited: *See—*
Pearce, Denis N., 3,887,139.
Ilzig, Karl F.; Junginger, Klaus M.; and Rieth, Alois, to Original Hanau Quarzlampen GmbH. Surgical operating lamp with individual spotlights. 3,887,801, Cl. 240-1.400.
Image Analysing Computers Limited: *See—*
Gibbons, John Michael; and Knowles, William Ralph, 3,887,764.
Imamura, Kennosuke: *See—*
Matsubara, Hiroyuki; Imamura, Kennosuke; Sogabe, Yuhei; and Aso, Toshio, 3,887,659.
Imperial Chemical Industries Limited: *See—*
Brown, James Peter; Jenner, Edwin Gordon; and Wilcock, John, 3,887,525.
Carding, John Raymond; and Peover, Cyril, 3,887,689.
Davies, Barrie Linton, 3,887,417.
Key, Kenneth Andrew; and Hooper, Clive William, 3,886,721.
McLean, William Ronald, 3,887,280.
Townley, Harry, 3,887,326.
Imura, Toshinori, to Minolta Camera Kabushiki Kaisha. Single lens reflex camera light measuring system. 3,887,929, Cl. 354-46.000.
Inayama, Takayuki: *See—*
Yamamoto, Nobuo; Yoneyama, Masakazu; Ueno, Wataru; and Inayama, Takayuki, 3,887,377.
Inductosyn Corporation: *See—*
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Industrial Mining Machinery Corporation: *See—*
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Industrial Pollution Control Corp.: *See—*
Weber, Roland E.; and Zimmermann, Carl J., 3,887,470.
Industrie Pirelli, S.p.A.: *See—*
Laberinti, Cesare, 3,887,735.
Ingersoll-Rand Company: *See—*
Pauley, Reginald W., 3,886,822.
Ingerson, Philip E. Foldable wheelchair and kit therefor. 3,887,228, Cl. 297-39.000.
Inman, Keith Erwin: *See—*
Charlson, Paul Marlin; Green, Charles Donald; Harris, William John; and Inman, Keith Erwin, 3,887,106.
Inmont Corporation: *See—*
Bolstad, Richard; and Melchoni, Anna F., 3,887,509.
Stone, Edward; Zamer, Joseph; Guagliardo, Matthew; and Wieland, Kenneth F., 3,887,757.
Zamer, Joseph, 3,887,755.
Inomata, Jihei; Hayashi, Masahiro; Nozawa, Seiichi; Ota, Takayuki; Endo, Kazuo; and Yamaguchi, Yukio, to Mitsubishi Chemical Industries, Ltd. Process for preparing copolymer. 3,887,651, Cl. 260-879.000.
Inomata, Yoichi: *See—*
Kachi, Kenjiro; Takeichi, Morio; Nakamura, Yasumasa; Inomata, Yoichi; and Nakano, Mitsuru, 3,887,274.
Inoue, Yoshio: *See—*
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Institut Francais du Petrole, des Carburants et Lubrifiants: *See—*
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Institute of Gas Technology: *See—*
Kardas, Alan; Larson, Dennis H.; and Nesbitt, John D., 3,886,976.
Instrumentation Laboratory, Incorporated: *See—*
Haddad, Ihsan A.; and Arsenault, Alvin R., 3,887,436.
Instrumentation Specialties Company: *See—*
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In'T Veld, Jan Man: *See—*
de Graaf, Wilhelmus Polycarpus; In'T Veld, Jan Man; and Vervaart, Adrianus Petrus, 3,887,847.
International Business Machines Corporation: *See—*
Bajorek, Christopher H.; and Thompson, David A., 3,887,944.
Bratter, Robert L.; and Gaind, Arun K., 3,887,726.
Champ, Robert Bruce; and Shattuck, Meredith David, 3,887,366.
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Nepela, Daniel A.; and Potter, Robert I., 3,887,945.
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Panek, George J.; and McCrea, Michael E., 3,887,257.
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Inventio Aktiengesellschaft: *See—*
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Ionics, Incorporated: *See—*
Hodgdon, Russell B., Jr., 3,887,499.
Irwin, Carl F., to du Pont de Nemours, E. I., and Company. Apparatus for manufacture of organic isocyanates. 3,887,167, Cl. 259-9.000.
Irwin, John A., to General Motors Corporation. Ceramic combustion liner. 3,886,735, Cl. 60-39.650.
Isaac, Eirlys R.: *See—*
Kirby, Peter; Isaac, Eirlys R.; and Smith, Graham C., 3,887,472.
Isaiah, Alvin K.: *See—*
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Ishikawa, Seiichi; Miya, Yooichi; Odate, Ryoji; and Kumai, Yasui, to Shiseido Co., Ltd. Receptacle for liquid material. 3,887,116, Cl. 222-520.000.
ISPOW AG: *See—*
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Itimura, Takeo: *See—*
Yamaguchi, Kazunori; Itimura, Takeo; Kaneko, Teruo; and Yamamoto, Hiroshi, 3,887,271.
Ito, Kazuichi. Reciprocating pump. 3,887,305, Cl. 417-439.000.
Ito, Shin; and Kawaguchi, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Hydraulic controls for transmission and brake systems with pressure booster. 3,887,049, Cl. 192-4.00A.
ITT Industries, Inc.: *See—*
Budecker, Ludwig; and Von Grunberg, Hubertus, 3,886,848.
Burgdorf, Jochen; and Eikenberg, Dieter, 3,887,044.
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Iwatsu Electric Company: *See—*
Kuwamura, Mitomu, 3,887,912.
Izawa, Masao; Ohlawa, Kiyoto; and Yuasa, Yookichi, to Agatsuma Seiki K. K. Digital timepiece. 3,886,725, Cl. 58-50.00R.
Jackson, Albert Edward, to British Steel Corporation. Method and apparatus for coating a metallic strip. 3,887,720, Cl. 427-32.000.
Jackson, Douglas: *See—*
Cunningham, Sinclair Upton; and Jackson, Douglas, 3,886,887.
Jackson, George W.: *See—*
Whelan, James E.; and Jackson, George W., 3,887,174.
Jackson, Joseph L., to R. O. Hull & Company Incorporated. Method for the reduction of zinc ion concentration and removal of organic impurities in a neutral or acidic, aqueous zinc plating bath. 3,887,445, Cl. 204-55.00R.
Jacobson, Peter E.; Lane, Arthur W.; and Ashley, Paul E., to Sperry Rand Corporation. Fluid bearing gyroscope. 3,886,803, Cl. 74-5.60D.
Jaedicke, Roland; and Schmidt, Ulfert, to Continental Gummi-Werke Aktiengesellschaft. Vulcanizing device for open hollow bodies, especially toroidal raw pneumatic tires. 3,887,313, Cl. 425-42.000.
Jahnel, Ernst; John, Erich; and Sinclair, Harold, to Messrs. Zahnraderfabrik Renk Aktiengesellschaft, DT. Ship's propulsion plant. 3,887,048, Cl. 192-3.280.
Jakob, Franz: *See—*
Blocker, Erich; Rupp, Walter; and Jakob, Franz, 3,887,521.
Jakubowski, Thaddeus, Jr., to McDonnell Douglas Corporation. Internal ejector mechanism. 3,887,150, Cl. 244-137.00R.
James Daivd, Inc.: *See—*
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James, David Richard: *See—*
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Jamrog, Aloysius R.: *See—*
Graae, Johan E. A.; Jamrog, Aloysius R.; Kelecius, Anthony S.; and Mingesz, Donald P., 3,887,247.
Jamshidi, Khosrow. Microcautery device. 3,886,944, Cl. 128-303.100.
Japan Exlan Company Limited: *See—*
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Japan Synthetic Rubber Company Limited: *See—*
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Jarke Corporation: *See—*
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Jaspers, Hendrik A., to North American Philips Corporation. Power-control system for stirling engines. 3,886,744, Cl. 60-521.000.

Jauss, Fritz, to Zentra Albert Burkle Kommanditgesellschaft. Method of and control circuit for admixing air. 3,887,127, Cl. 236-91.000.

Jay, Richard S., to Jarke Corporation. Unitized modular rack for vertical storage of flat sheet materials. 3,887,078, Cl. 211-50.000.

Jayne, Murray L. Fluid driven hammers. 3,887,018, Cl. 173-120.000.

Jefferson Chemical Company, Inc.: *See—*
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Jejina, Filip: *See—*
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Jenkins, Cecil: *See—*
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Jenkins, Charles W., to Owens-Illinois, Inc. Fluid cooling of glass molds. 3,887,350, Cl. 65-267.000.

Jenner, Edwin Gordon: *See—*
Brown, James Peter; Jenner, Edwin Gordon; and Wilcock, John, 3,887,525.

Jeter, Harold W., Jr., to Caterpillar Tractor Co. Tractor test cell. 3,886,788, Cl. 73-117.000.

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John, Erich: *See—*
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John Hadland Photographic Instrumentation Ltd.: *See—*
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John Laing & Son Limited: *See—*
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John Mohr & Sons: *See—*
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John Zink Company: *See—*
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Johnson, Andrew L. Oil cooler and filter container for engine. 3,887,467, Cl. 210-186.000.

Johnson, Dee Lynn, to Minnesota Mining and Manufacturing Company. Personal care viewer. 3,887,800, Cl. 240-1.0EL.

Johnson, Edward Lawrence: *See—*
Scholl, Rolland Dale; Coleman, Donald Frederick; Johnson, Edward Lawrence; and Streight, William Edward, 3,887,012.

Johnson, Gordon W., to Caterpillar Tractor Co. Single pump hydrostatic transmission control and supply system. 3,886,742, Cl. 60-488.000.

Johnson, James E.: *See—*
Law, Anthony G.; and Johnson, James E., 3,886,831.

Johnson, James W.; and Knapp, Gladys Janet. Cigarette and the like filter and method for producing same. 3,886,955, Cl. 131-261.00R.

Johnson, John R., to Owens-Illinois, Inc. Moving mask for shielding articles. 3,886,899, Cl. 118-504.000.

Johnson & Johnson: *See—*
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Johnson, Keith G.; and Limbach, Anthony Paul, to Arco Polymers, Inc. Extruder die for multiple stream extrusion. 3,887,322, Cl. 425-466.000.

Johnson, Richard G. Continuous combustion engine. 3,886,734, Cl. 60-39.610.

Johnson, William R., Jr.: *See—*
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Johnston, David B. R.: *See—*
Wehrmeister, Herbert L.; Johnston, David B. R.; and Windholz, Thomas B., 3,887,583.

Jones, Elvis E.; Mays, William A.; and Smith, William F., to Dow Chemical Company, The. Valve. 3,886,963, Cl. 137-334.000.

Jones, Fred W.: *See—*
Thompson, Charles H.; and Jones, Fred W., 3,886,666.

Jones, John M., to Texaco Inc. Well logging system using 3 phase AC power supply. 3,887,898, Cl. 340-18.00R.

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Kabasawa, Yoshiji: *See—*
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Brzozowski, Zbigniew; Porejko, Stanislaw; Kielkiewicz, Jedrzej; and Kaczorowski, Janusz, 3,887,522.

Kahn, Burton M. Method of manufacturing reinforced concrete panels. 3,886,648, Cl. 29-452.000.

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Kitchens, Lee Glen, to Texas Instruments Incorporated. Prismatic display window for a calculator. 3,887,791, Cl. 235-1.00D.

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Klein, Frank N.: *See—*
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Korsell, Torsten; Larker, Hans; Lundblad, Erik; and Nilsson, Jan, to Allmanna Svenska Elektriska Aktiebolaget. Die for manufacturing rods or wire of compounds material with non-round cross-section. 3,886,775, Cl. 72-60.000.

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Krieger, Friedrich; and Stein, Christian, to Siemens Aktiengesellschaft. Layer circuit with at least one solder platform for the soldering on of semiconductor modules. 3,887,760, Cl. 174-68.500.

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Krok, Frank S., to General Motors Corporation. Hydrodynamic torque converter with hydraulically energized one-way roller clutch. 3,886,740, Cl. 60-341.000.

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Krueger, Ralph A. Paint roller cleaning apparatus. 3,886,960, Cl. 134-138.000.

Kruka, Vitold R.: *See*—
Scott, Paul R.; Chavez, Victor J.; and Kruka, Vitold R., 3,886,972.

Krupen, Philip, to United States of America, Army. Contact fuze. 3,886,867, Cl. 102-70.20R.

Kubelka, Joseph R., Jr. Arrangement for closing a kelly-cock supported on a rotary swivel with a stem therefrom. 3,887,161, Cl. 251-58.000.

Kudo, Mitsuhiro: *See*—
Kawabe, Ushio; Kudo, Mitsuhiro; Fukase, Shigeo; and Ishibashi, Masato, 3,887,364.

Kuhajek, Eugene J.; Fiedelman, Howard W.; and Tibbitts, Gordon H., to Morton-Norwich Products, Inc. Method for regeneration of cation exchange resins and for removal of iron deposits therefrom. 3,887,498, Cl. 260-2.20R.

Kuhl, Franz: *See*—
Plocher, Werner; Ihlingen, Horb; Kuhl, Franz; and Huttermann, Bernhard, 3,887,317.

Kuhla, Donald E.: *See*—
Evanega, George R.; Kuhla, Donald E.; and Sarges, Reinhard, 3,887,561.

Kuhlmann, Franz, to Franz Kuhlmann KG, Prazisionsmechanik und Maschinebau. Pantograph copy milling machine with drawing tracing device. 3,886,847, Cl. 90-13.800.

Kuihara, Kenzo: *See*—
Shigeyasu, Motoo; and Kuihara, Kenzo, 3,887,612.

Kulakov, Nikolai Konstantinovich; Likhogub, Evgeny Petrovich; Dorfman, Gersh Abramovich; and Suslov, Alexandr Nikolaevich. Plant for discharging coke from horizontal-flue coke oven. 3,887,438, Cl. 202-262.000.

Kumai, Yasui: *See*—
Ishikawa, Seiichi; Miya, Yooichi; Odate, Ryoji; and Kumai, Yasui, 3,887,116.

Kumata, Seiji; Shimoi, Youichi; Hirabayashi, Terubika; and Hiwatashi, Yukinori, to Nittetu Chemical Engineering Limited. Process for purifying a gas containing hydrogen sulfide and hydrogen cyanide. 3,887,682, Cl. 423-232.000.

Kumazawa, Shoichiro, to Kabushiki Kaisha Seikosha. Control apparatus for an intermittently rotated indexed wheel. 3,887,825, Cl. 310-37.000.

Kume, Takeo: *See*—
Tokunaga, Takeshi; Maekawa, Toshiaki; Uno, Takeshi; Akagi, Tadashi; Abe, Nobuyuki; Kume, Takeo; Ohnishi, Yukio; and Shimomura, Yasumi, 3,886,821.

Kummer, Werner: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; and Hoefke, Wolfgang, 3,887,552.

Kuraray Co., Ltd.: *See*—
Okamura, Takayuki; and Minatono, Shobu, 3,887,527.

Kurasawa, Yoshiya, to Nissan Motor Company Limited. Safety device actuating arrangement. 3,887,819, Cl. 307-10.00R.

Kurita, Takashi; Yamamoto, Hiroshi; and Makabe, Hideki, to Shimadzu Seisakusho Ltd. Spectrophotometric measurement system. 3,887,281, Cl. 356-96.000.

Kurtz, Abraham Nathan; and Farmer, Melvin Lee, to Union Carbide Corporation. Oxidation of 2-chlorobutene to chloroprene. 3,887,626, Cl. 260-655.000.

Kurumada, Tomoyuki: *See—*
Murayama, Keisuke; Matsui, Katsuaki; and Kurumada, Tomoyuki, 3,887,517.

Kuwada, Yutaka: *See—*
Tawada, Hiroyuki; Meguro, Kanji; and Kuwada, Yutaka, 3,887,541.

Kuwamura, Mitomu, to Iwatsu Electric Company. Analogue-digital converter apparatus. 3,887,912, Cl. 340-347.000.

La Cellophane: *See—*
Brunet, Jacques; and Rigaux, Jean-Claude, 3,887,579.
Deshayes, Phillippe M.; and Weber, Guy Paul, 3,886,900.

Labalme, Pierre, to Compagnie Honeywell Bull (Societe Anonyme). Method and apparatus for processing calls distributed randomly in time and requiring response delays of any duration, but specified for each call. 3,887,902, Cl. 340-172.500.

Labaz: *See—*
Cier, Andre; Gero, Stephan; and Olesker, Alain, 3,887,590.

Laberinti, Cesare, to Industrie Pirelli, S.p.A. Upholstery articles and process for their manufacture. 3,887,735, Cl. 428-71.000.

Laboratoires G.-A. Cochard: *See—*
Cochard, Pierre E.; and Vandecauter, Roger, 3,887,175.

Laboratorios Berenguer Beneyto S.A.: *See—*
Cobo Barrachina, Gonzalo, 3,887,562.

Labran, Garrie; and Chabrak, Thomas A. Self cleanable hair brush. 3,886,617, Cl. 15-169.000.

Lachowicz, Donald R.; Saines, George S.; and Eckert, George W., to Texaco Inc. Preparation of nitroketonized amides. 3,887,593, Cl. 260-404.500.

Lafontaine, Florian. Switch mechanism ensuring the automatic closing of a motor-operated garage door. 3,887,890, Cl. 337-103.000.

Lagess, Thomas F.; and Maudlin, Valroy Henry, to Dow Chemical Company, The. Disposal of waste streams containing asbestos. 3,887,462, Cl. 210-53.000.

Lagowski, Jacek: *See—*
Gatos, Harry C.; and Lagowski, Jacek, 3,887,937.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des procedes Georges Claude: *See—*
Perrotin, Guy; and Anselmini, Jean-Pierre, 3,886,758.

Lally, Joseph Edward, to Bally Manufacturing Corporation. Random selective switching apparatus. 3,887,192, Cl. 273-138.00A.

Lambert, William M. Collapsible structural member. 3,886,700, Cl. 52-108.000.

Lammy, James E.; Francis, Thomas; and Canter, Lawrence E., to Scott Port-A-Fold, Inc. Pivotable arm rest for boat seat. 3,886,611, Cl. 9-7.000.

Lancaster Research and Development Corporation: *See—*
Geschwender, Robert C., 3,887,419.

Lancelot, Charles J.; Blumbergs, John H.; and MacKellar, Donald G., to FMC Corporation. Process for the homopolymerization of maleic anhydride. 3,887,526, Cl. 260-78.40R.

Landesman, Eric; and Palmiter, Donald R., to Elgin Sweeper Company. Vacuum type sweeper. 3,886,623, Cl. 15-319.000.

Landesman, Eric; and Palmiter, Donald R., to Elgin Sweeper Company. Vacuum type sweeper. 3,886,624, Cl. 15-340.000.

Landis, Alfred R.; and Torrence, Sammie B., to Kearney-National Inc. Electric grounding apparatus. 3,887,254, Cl. 339-5.00R.

Landreville, Patrick M. Tilting tube with rolling member game. 3,887,185, Cl. 273-109.000.

Lane, Arthur W.: *See—*
Jacobson, Peter E.; Lane, Arthur W.; and Ashley, Paul E., 3,886,803.

Lane, William C., to Mead Corporation, The. Unitary plastic laminate. 3,887,743, Cl. 428-206.000.

Lang, Walter: *See—*
Hegar, Gert; Angliker, Hans-Joerg; Lang, Walter; Liechti, Hans Wilhelm; and Milicevic, Branimir, 3,887,329.

Langbein, Adolf: *See—*
Merz, Herbert; Langbein, Adolf; Wick, Helmut; and Stockhaus, Klaus, 3,887,686.

Lange, K. Robert: *See—*
Hsu, Yuan Tsun; and Lange, K. Robert, 3,887,340.

Langren, Robert J., to Hosmer/Dorrance Corporation. Clamp joint for separated members. 3,887,291, Cl. 403-391.000.

Lannert, Kent P., to Monsanto Company. Hydroxy ether carboxylates. 3,887,616, Cl. 260-535.00P.

Laputte, Robert: *See—*
Agouri, Elias; Laputte, Robert; Philardeau, Yves; and Rideau, Jacques, 3,887,650.

Larker, Hans: *See—*
Korsell, Torsten; Larker, Hans; Lundblad, Erik; and Nilsson, Jan, 3,886,775.

Larkin, Sam. Sand molding apparatus. 3,886,993, Cl. 164-211.000.

Larsen, Mogens Drost. Document filing rack. 3,887,076, Cl. 211-10.000.

Larson, Dennis H.: *See—*
Kardas, Alan; Larson, Dennis H.; and Nesbitt, John D., 3,886,976.

Larson, Willis A.; and Colglazier, David E., to Magic Dot, Inc. Apparatus and material for protecting microelectronics from high potential electricity. 3,887,848, Cl. 317-33.00R.

Larsson, Ivar F. Triangular drive for screen printer. 3,886,864, Cl. 101-126.000.

La Rue, Mervin W., Jr., to Bell & Howell Company. Battery holder assembly. 3,887,393, Cl. 136-173.000.

Laurila, Erkki A., to Bermeco Oy. Permanent magnet strong field separator. 3,887,458, Cl. 209-219.000.

Law, Andrew B.: *See—*
Lewis, Sheldon N.; Miller, George A.; and Law, Andrew B., 3,887,352.

Law, Anthony G.; and Johnson, James E., to Chase Brass and Copper Co., by said Anthony G. Law. Electrohydraulically controlled cut off saw. 3,886,831, Cl. 83-294.000.

Lawson, Lewis E.: *See—*
Evans, Owen H.; Lawson, Lewis E.; Montaigne, Michel L.; and Muir, Gordon A., 3,886,858.

Lazarus, Alfred; and Lazarus, Jean-Jaques. Stylus device for the vision of image sequences. 3,887,270, Cl. 350-241.000.

Lazarus, Jean-Jaques: *See—*
Lazarus, Alfred; and Lazarus, Jean-Jaques, 3,887,270.

Lee, Bong Kuk; Neidleman, Saul Lewis; and Ryu, Dewey D. Y., to E. R. Squibb & Sons, Inc. 1-Amino substituted 1-cycloalkane derivatives of 7-aminocephalosporanic acid and 7-aminodesacetoxy cephalosporanic acid. 3,887,546, Cl. 260-240.00G.

Lee C. Moore Corporation: *See—*
Woolslayer, Homer J.; and Jenkins, Cecil, 3,887,086.

Lee, Richard K., to Universal Oil Products Company. Heating of catalytic converter casing. 3,886,739, Cl. 60-286.000.

Leet, Richard A. Tail gate lift mechanism. 3,887,092, Cl. 214-75.00T.

Leete, Bernard D., to General Electric Company. Optical driver circuit. 3,887,836, Cl. 315-207.000.

LeHenaff, Madame Maryvonne: *See—*
Lucien, Rene; and LeHenaff, Madame Maryvonne, 3,886,670.

Lehmann, Jerry Hans, to Burroughs Corporation. Demountable-pluggable tensioning and re-inking ribbon cartridge. 3,887,056, Cl. 197-168.000.

Leiber, Heinz; Gerstenmeier, Jurgen; and Korasiak, Wolfgang, to Teldix GmbH. Antilock control system for vehicles. 3,887,240, Cl. 303-21.00P.

Leichsenring, Carl Hans: *See—*
Antoni, Heinz; and Leichsenring, Carl Hans, 3,887,162.

Leidich, Arthur John, to RCA Corporation. Bias circuitry for stacked transistor power amplifier stages. 3,887,880, Cl. 330-22.000.

Leir, Charles M., to Riker Laboratories, Inc. Process for piperidine derivatives. 3,887,568, Cl. 260-293.800.

Leitz, Herbert: *See—*
Seebach, Dieter; and Leitz, Herbert, 3,887,617.

Leland Stanford Junior University, The Board of Trustees of: *See—*
McConnell, Harden M.; and Humphries, Gillian K., 3,887,698.

Le Mieux, Robert W.: *See—*
Crossman, Phillip E.; Kenrick, Robert C.; and Le Mieux, Robert W., 3,887,187.

Lemke, Hans, to Produits Chimiques Ugine Kuhlmann. Treatment of organic effluents from the halcon process to precipitate the metal used as catalyst. 3,887,361, Cl. 75-108.000.

Lennington, John W.: *See—*
Sternberg, Stanley P.; Young, James E.; and Lennington, John W., 3,887,473.

Lentz, Carl A., to General Motors Corporation. Transmission shift control. 3,886,819, Cl. 74-868.000.

Lentz, Carl A., to General Motors Corporation. Transmission and control. 3,886,820, Cl. 74-869.000.

Leon, John E. Concrete imprinting apparatus and method. 3,887,294, Cl. 404-89.000.

Le Page, Jean-Francois: *See—*
Juguin, Bernard; and Le Page, Jean-Francois, 3,887,495.

L'Eplattenier, Francois: *See—*
Eicke, Hans; Arnold, Vladimir; and L'Eplattenier, Francois, 3,887,598.

Leroy, Jean: *See—*
Lipschutz, Paul; and Leroy, Jean, 3,887,029.

Levenstein, Stanley. Device for forming pleated curtains. 3,887,118, Cl. 223-28.000.

Lever Brothers Company: *See—*
Eykelboom, Adolf Jan; and Tonsbeek, Christiaan Herman Theodoor, 3,887,589.

Lew, Hyok Sang. Lettering set. 3,886,663, Cl. 33-23.00D.

Lewals, Inc.: *See—*
Walls, Leroy C., 3,886,892.

Lewicki, Walter J., Jr., to Armstrong Cork Company. Mechanically embossed resilient laminar floor material. 3,887,678, Cl. 264-284.000.

Lewis, Sheldon N.; Miller, George A.; and Law, Andrew B., to Rohm and Haas Company. Control of microorganisms with 3-hydroxyisothiazoles. 3,887,352, Cl. 71-67.000.

Lewis Woolf Griptight Limited: *See—*
Hurst, Eric Kenneth; and Moore, Ronald Keith, 3,886,949.

Liakumovich, Alexandr Grigorievich; Zakharova, Nina Vasilievna; Khamidullin, Rashid Idrisovich; and Zakrevsky, Vladimir Mikhailovich. Process for purifying diene hydrocarbons from acetylene hydrocarbon contaminants. 3,887,632, Cl. 260-681.50R.

Liberty Winery, Inc.: *See—*
Buck, Charles Herbert, 3,887,091.

Libkie, Herbert A., to General Motors Corporation. Valve arrangement for a vehicular inflatable cushion. 3,887,109, Cl. 222-3.000.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Fischer, Horst; and Pschunder, Willi, 3,887,935.

Lichtenstein, Joseph. Aqueous zinc solutions for physiological use. 3,887,704, Cl. 424-145.000.

Liebert, Karl-Heinz, to Zahnradfabrik Friedrichshafen AG. Valve porting arrangement for a gerotor. 3,887,308, Cl. 418-61.00B.

Liechti, Hans Wilhelm: *See—*
Hegar, Gert; Angliker, Hans-Joerg; Lang, Walter; Liechti, Hans Wilhelm; and Milicevic, Branimir, 3,887,329.

Lieske, Manfred: *See—*
Olsen, Willi; Lieske, Manfred; Ehmann, Wolfgang; and Perst, Gerhard, 3,887,915.

Likhogub, Evgeny Petrovich: *See—*
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Johnson, Keith G.; and Limbach, Anthony Paul, 3,887,322.

Linde Aktiengesellschaft: *See—*
Becker, Rudolf; and Becker, Wolfgang, 3,886,885.

Lindgren, Theodore P. Asynchronous n bit position data shifter. 3,887,799, Cl. 235-164.000.

Lindius, Gosta: *See—*
Forssen, Zeth; and Lindius, Gosta, 3,886,983.

Lindner, Charles B.: *See—*
Duane, John J.; and Lindner, Charles B., 3,886,941.

Lindner, Robert G., to H. H. Robertson Company. Method for fabricating double-skin foam core construction panels. 3,887,410, Cl. 156-79.000.

Lion Fat & Oil Co., Ltd.: *See—*
Nakamura, Masayoshi; Tamura, Tadayoshi; and Toyoda, Sadao, 3,887,137.

Lipschutz, Paul; and Leroy, Jean, to Societe d'Exploitation des Brevets Neiman. Anti-theft devices. 3,887,029, Cl. 180-114.000.

Lipson, Melvin A.: *See—*
Gilano, Michael N.; Beaupre, Richard E.; and Lipson, Melvin A., 3,887,450.

Listkov, Viktor Fedorovich: *See—*
Vernik, Alexandr Borisovich; Listkov, Viktor Fedorovich; Skorupsky, Boris Pavlovich; Grinshpun, Mark Izrailevich; Tetelbaum, Petr Iosifovich; Tyrtov, Anatoly Sergeevich; Konyaev, Vladimir Petrovich; Afanasiev, Ivan Petrovich; Kazakevich, Igor Illarionovich; Kalinushkin, Pavel Nikitovich; Andreev, Ivan Ivanovich; and Sukhanov, Alexandr Alexandrovich, 3,886,651.

Litton Medical Products, Inc.: *See—*
Cooley, Austin G., 3,887,816.
Karlov, Frank J.; Sidorewicz, Leonidas; Redfield, Charles L.; and Evans, Robert, 3,887,889.

Liu, Hsing-Ching, to Liu, Hsing-Ching; and Wei, Ching Huei. Linguistic self learning device. 3,886,671, Cl. 35-35.00C.

Livesay, William R., to Radiant Energy Systems, Inc. Electro mechanical alignment apparatus for electron image projection systems. 3,887,811, Cl. 250-442.000.

Lockhead Aircraft Corporation: *See—*
Wirt, Leslie S., 3,887,031.

Loesch, Robert Phillip, to Western Electric Company, Incorporated. Tension speed control for a rotatable strand supply utilizing a transformer having variable primary and secondary windings. 3,887,851, Cl. 318-6.000.

Lohr, Ernest F., to SCM Corporation. Dual tone margin signal for typewriters. 3,887,058, Cl. 197-192.000.

Long, Robert B.; Caruso, Fred A.; DeFeo, Richard J.; and Walker, David G., to Exxon Research and Engineering Company. Bimetallic salts and derivatives thereof, their preparation and use in the complexing of ligands. 3,887,600, Cl. 260-438.100.

Lonza, Ltd.: *See—*
Schmid, Eduard; Nascher, Reinold; Egli, Rene; Parratt, Noel James; and Gooding, Ronald William, 3,887,429.

Looman, Wolfgang; Pungs, Wolfgang; Bierwirth, Egon; and Buning, Robert, to Dynamit Nobel AG. Vinylchloride-alkylene copolymer and uses therefor. 3,887,728, Cl. 427-185.000.

Loop-A-Line, Inc.: *See—*
McGahee, Welbourne D., 3,886,773.

Lottes, Karlheinz; and Katzer, Hans, to Consortium fur Elektrochemische Industrie GmbH. Precipitation polymerization of 1:1 copolymerizates of maleic acid anhydride and allyl acetate. 3,887,528, Cl. 260-78.50R.

Loughner, James W. Classifier with rifflers and variable throat. 3,887,456, Cl. 209-211.000.

Louzecky, Paul J., to General Motors Corporation. Rotary machine apex seal. 3,887,311, Cl. 418-113.000.

Lover, Myron J.; and Speranza, Joseph P., to Merck & Co., Inc. Oral hygiene products. 3,887,712, Cl. 424-326.000.

Lowen, Michael David, to John Laing & Son Limited. Monitoring apparatus. 3,886,665, Cl. 33-174.00R.

Lowe's, Inc.: *See—*
Zeitter, Charles R., 3,886,901.

Loyd, Robert W., Jr., to Curtiss-Wright Corporation. Gas fueled rotary engine. 3,886,907, Cl. 123-8.130.

Lucas, Charles H., to Raymond Lee Organization, Inc., The. Football board game apparatus. 3,887,191, Cl. 273-134.0DB.

Lucien, Rene; and LeHenaff, Madame Maryvonne. Audio-visual educational apparatus. 3,886,670, Cl. 35-9.00A.

Ludwig Engel KG: *See—*
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Luiten, Peter H., to Aerojet-General Corporation. Gravity chute systems. 3,887,053, Cl. 193-34.000.

Lummus Company, The: *See—*
Schoonman, Willem, 3,887,002.

Lundblad, Erik: *See—*
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Lundin, Holger Alexander, to Telefonaktiebolaget L M Ericsson. Method for locating an underground cable. 3,886,755, Cl. 61-72.600.

Lundsgaard, Jorgen Schjerning; and Degn, Hans Peter. Apparatus for regulating the ratio of mixing of two fluid flows. 3,886,971, Cl. 137-599.000.

Lunsden, James C.: *See—*
Spratt, Brendan J.; and Lunsden, James C., 3,887,921.

Luthgens, Uwe: *See—*
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Luwa AG: *See—*
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M & B Metal Products Company: *See—*
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Maag, Guido: *See—*
Glaus, Bernhard Max; Maag, Guido; and Knus, Hermann, 3,887,087.

Maas, Hermann; Abratis, Horst; and Raeune, Claus, to Rheinstahl Huettenwerke AG. Method of treating metal melts with a purging gas during the process of continuous casting. 3,886,992, Cl. 164-56.000.

Macheski, Robert L.: *See—*
Rodak, John J.; and Macheski, Robert L., 3,887,806.

Machine Tool Divisional Services Limited: *See—*
Hodgson, Brian, 3,886,845.

MacInnis, Martin B.; Vanderpool, Clarence D.; and Boyer, Carl W., to GTE Sylvania Incorporated. Process for recovering tungsten from tungsten carbides containing an iron group of metals. 3,887,680, Cl. 423-55.000.

MacKellar, Donald G.: *See—*
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MacKenzie, Albert H. Lightweight transportable tent cot. 3,886,609, Cl. 5-110.000.

MacKenzie, George D.: *See—*
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MacMillan Bloedel Limited: *See—*
Gunn, John Wolferston; and Murphy, Leonard Adolphus, 3,886,833.

Maddock, Paul Thomas. Heat treatment apparatus. 3,887,328, Cl. 432-224.000.

Maeder, Arthur: *See—*
Nachbur, Hermann; and Maeder, Arthur, 3,887,553.

Maekawa, Toshiaki: *See—*
Tokunaga, Takeshi; Maekawa, Toshiaki; Uno, Takeshi; Akagi, Tadashi; Abe, Nobuyuki; Kume, Takeo; Ohnishi, Yukio; and Shimomura, Yasumi, 3,886,821.

Magic Dot, Inc.: *See—*
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Magnetic Analysis Corporation: *See—*
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Magnetic Engineering Associates Inc.: *See—*
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Maher, Lawrence J.: *See—*
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Maier, Karl: *See—*
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Main, Ralph M.: *See—*
Paramonoff, Elpidifor; and Main, Ralph M., 3,886,781.

Mair, William Norman: *See—*
Bickerdike, Robert Lewis; Mair, William Norman; and Thomas, Evan Samuel, 3,887,001.

Maisonneuve, Hubert; and von Beckmann, Helmut, to Canron Inc. Adjustable auger cover for snow blower. 3,886,675, Cl. 37-25.000.

Majumdar, Amalendu Jyoti, to National Research and Development Corporation. Glass fibres and compositions containing glass fibres. 3,887,386, Cl. 106-99.000.

Makabe, Hideki: *See—*
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Mal, M. Kumar: *See—*
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Malden Mills, Inc.: *See—*
Dargie, Philip A., 3,886,767.

Malinowski, William J., to United States of America, Navy. Retractable pendant support. 3,887,149, Cl. 244-110.00C.

Malkina, Anna Davydovna: *See—*
Patrikeev, Veniamin Vasilievich; Malkina, Anna Davydovna; and Kartsivadze, Amiran Ilich, 3,887,580.

Mallen, Walter Tony, to Nitro Nobel AB. Method and composition for removal of soot and deposits from heat exchange surfaces of combustion units. 3,886,872, Cl. 110-1.00J.

Malone, Denis Frederick, to Dunlop Limited. Disc brakes. 3,887,041, Cl. 188-71.500.

Mangold, Donald J.; and Vetterli, John E., to Flecto Company, Inc., The. Liquid fabric wall cover. 3,887,940, Cl. 260-8.000.

Mannaka, Toshio; Kitanosono, Hidehiro; and Matsuka, Shigemichi, to Hitachi, Ltd. Optimum electroplating plant control device. 3,887,452, Cl. 204-211.000.

Mannesmannrohren-Werke Aktiengesellschaft: *See*—
Stromstedt, Sven Sixten; and Bystrom, Sven Borje, 3,886,774.

Manoussos, Georges; and Berrebi, Claudine, to Societe Anonyne dite: L'Oreal. Mucopolysaccharides, their preparation and use in cosmetic and pharmaceutical compositions. 3,887,703, Cl. 424-95.000.

Manthey, Joseph W.: *See*—
Brongo, Ralph T.; Fleming, James C.; and Manthey, Joseph W., 3,887,374.

Manx Mail Order Limited: *See*—
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Mao, Chung-Ling, to Uniroyal, Inc. 3-(Hydroxyhydrocarbylsecondaryamino)thiophene 1,1-dioxides and polyurethanes chain extended therewith. 3,887,503, Cl. 260-2.5AM.

Marason, Gabriel, Jr., to Mattel, Inc. Control member for toy airplane. 3,886,681, Cl. 46-77.000.

Marcell, Sam A. Fish bait dispenser. 3,886,679, Cl. 43-55.000.

Marchant, Keith: *See*—
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Marconi Company Limited, The: *See*—
Bell, Philip Richard, 3,887,911.

Margolis, David Saul; and Taylor, John Edward, to British Insulated Callender's Cables Limited. Optical guides. 3,887,265, Cl. 350-96.00B.

Margraf, Adolf. Pocket or bag filter with dust recirculation. 3,887,343, Cl. 55-262.000.

Marini, Maresco: *See*—
Adembri, Giorgio; Tedeschi, Piero; Ponticelli, Fabio; and Marini, Maresco, 3,887,578.

Markhart, Albert H.; and Santer, James O., to Monsanto Company. Electroconductive sheet material and process of preparation. 3,887,751, Cl. 428-342.000.

Marston, Peter G.; Wechsler, Ionel; and Nolan, John J., to Magnetic Engineering Associates Inc. Magnetic separation method. 3,887,457, Cl. 209-214.000.

Martell, Charles Ronald, to Camsco, Inc. Interactive man-machine method and system for grading pattern pieces and for producing an apparel marker. 3,887,903, Cl. 340-172.500.

Martin, Donald L., to General Electric Company. Cobalt-rare earth magnets comprising sintered products bonded with cobalt-rare earth bonding agents. 3,887,395, Cl. 148-31.570.

Martynov, Oleg Viktorovich: *See*—
Tseitlin, Aron Yakovlevich; Martynov, Oleg Viktorovich; Ordinartsev, Jury Nikolaevich; Ordinartsev, Vladimir Nikolaevich; Tishkin, Evgeny Pavlovich; Tikhonov, Sergei Sergeevich; and Belousov, Alexeevich Vladimir, 3,886,996.

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Marx, Gerhard; and Frank, Hermann, to Hoechst Aktiengesellschaft. Corona discharge device. 3,887,809, Cl. 250-324.000.

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Matlock, Oscar N., Jr., to Brunswick Corporation. Broadhead. 3,887,186, Cl. 273-106.50B.

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Matsubara, Yukio: *See*—
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Okamura, Seizo; Tagawa, Tomoaki; Yagami, Kazuo; Matsuo, Kazuto; Sakabe, Mitsuo; Sogo, Tsutomu; Korematsu, Mikio, deceased; and Korematsu, Etsuko, widow and legal successor, 3,887,676.

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Matsuyama Petrochemicals Inc.: *See*—
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McClintock, William A.; and Clark, Merlin O., to Phillips Petroleum Company. Reduction of hydrate formation in a natural gas stream by contacting with anit-freeze agent. 3,886,757, Cl. 62-20.000.

McCloskey, Albert R., to Rockwell International Corporation. Anti-friction ball bearing assembly. 3,887,246, Cl. 308-6.00C.

McClure, William M.; and Klintworth, Keith K., to Caterpillar Tractor Co. Pressure balanced ring seal. 3,887,198, Cl. 277-27.000.

McConnell, Harden M.; and Humphries, Gillian K., to Leland Stanford Junior University, The Board of Trustees of. Sacs with epitopic sites on walls enclosing stable free radicals. 3,887,698, Cl. 424-12.000.

McConnell, Robert B., to Ashland Oil, Inc. Quaternary ammonium derivatives of bisimidazoline compounds for use as fabric softeners. 3,887,476, Cl. 252-8.750.

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McDaniel, Marvin L.; and Ivashuk, Michael. Pressure release method. 3,887,108, Cl. 222-1.000.

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McLean, William Ronald, to Imperial Chemical Industries Limited. Analytical apparatus and method of analysis. 3,887,280, Cl. 356-85.000.
McNamee, Gerald P. Method for recovery of hydrocarbon vapors. 3,886,759, Cl. 62-54.000.
McNeil Laboratories, Incorporated: *See—*
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McPhee, Charles J.: *See—*
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McRobert, Leon R. Trash separator. 3,886,951, Cl. 130-30.00R.
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Merstallinger, Kurt; and Schindl, Klaus P., to C. Reichert Optische Werke, AG. Optical system for a microscope photometry attachment. 3,887,283, Cl. 356-219.000.
Merz, Herbert; Langbein, Adolf; Wick, Helmut; and Stockhaus, Klaus, to Boehringer Ingelheim GmbH. Pharmaceutical compositions containing a 2-(furyl-methyl)-6,7-benzomorphan and method of use. 3,887,686, Cl. 424-267.000.
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Metzger, Emil. Process for producing granular, expanded ceramic materials. 3,887,671, Cl. 264-43.000.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, to Bayer Aktiengesellschaft. Process for producing 2,6-diamino -1,4-dihydro-3,5-pyridine-dicarboxylates and derivatives thereof. 3,887,558, Cl. 260-256.40C.
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Michel, Edmond; and Duikers, Marcel, to Solvay & Cie. Method and apparatus for deflashing hollow plastic articles. 3,886,824, Cl. 82-47.000.
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Miller, Roland E., to Kraftco Corporation. Method and apparatus for handling process cheese spread. 3,887,719, Cl. 426-517.000.
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Mills, Noel; Balmford, David Ernest Hall; and Saunders, James Edwin, to Westland Aircraft Limited. Vibration absorbing systems. 3,887,296, Cl. 416-145.000.
Mimura, Norihisa; Uehaka, Takao; and Kato, Hisatoyo. Liquid sensitometry process for photographic emulsions. 3,887,333, Cl. 23-230.00R.
Minami, Shinsaku; Matsumoto, Jun-Ichi; Kawaguchi, Kazuyo; Mishio, Shinsaku; Shimizu, Masanao; Takase, Yoshiyuki; and Nakamura, Shinichi, to Dainippon Pharmaceutical Co. Ltd. Piperazine derivatives and processes for preparation thereof. 3,887,557, Cl. 260-256.40F.
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Mukerjee, Ambar Nath, to Hoechst Aktiengesellschaft. Process for the manufacture of a light colored thermostable chlorinated polyolefin. 3,887,533, Cl. 260-88.200.

Muller, Adolf, to Schloemann-Siemag Aktiengesellschaft. Shear. 3,886,828, Cl. 83-150.000.

Munch, Robert James, to American Cyanamid Company. Concentrating acrylamide solutions. 3,887,425, Cl. 159-48.00L.

Murahse, Katsuo; and Hara, Kazuyuki, to Kabushiki Kaisha Ricoh. Optical line scanning system. 3,887,765, Cl. 178-7.600.

Murakami, Kikuo: *See—*
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Murata, Kiyoo, to New Japan Slide Fastener Mfg. Co., Ltd. Zipfastener. 3,886,634, Cl. 24-205.13R.

Murayama, Keisuke; Matsui, Katsuaki; and Kurumada, Tomoyuki, to Sankyo Co., Ltd. Piperidine derivatives and their use as stabilizers. 3,887,517, Cl. 260-45.80N.

Murphy, Leonard Adolphus: *See—*
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Nachbur, Hermann; and Maeder, Arthur, to Ciba-Geigy AG. Process for the manufacture of phosphorus-containing condensation products. 3,887,553, Cl. 260-249.600.

Nachtigal, Julius Harvey, to Colgate-Palmolive Company. Antibacterial oral compositions containing preservative-antioxidants. 3,887,701, Cl. 424-54.000.

Nagano, Masashi, to Shimaro Industrial Co., Ltd. Operating lever for actuating a gear-shifting means mounted on a bicycle. 3,886,806, Cl. 74-491.000.

Nagashima, Shinichiro; and Tuneda, Terukuni, to Canon Kabushiki Kaisha. Toners. 3,887,560, Cl. 260-267.000.

Nagatoshi, Fumio: *See*—
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Nakada, Masahiko; Matsumoto, Hirobumi; and Kobayashi, Nobuyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Carburetor with automatic choke. 3,886,917, Cl. 123-119.00F.
Nakagawa, Jihei, to Olympus Opitcal Co., Ltd. Supertelescopic lens system. 3,887,269, Cl. 350-216.000.
Nakagawa, Yoshinobu: *See*—
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Nakai, Susumu; and Matsumura, Hisashi, to Honshu Paper Company, Ltd. Apparatus for producing fibrous mats. 3,886,629, Cl. 19-156.300.
Nakamura, Junji; Miyashiro, Shigeyoshi; and Okada, Hiroshi, to Ajinomoto Co., Inc. Method of producing yeast cells. 3,887,435, Cl. 195-82.000.
Nakamura, Masayoshi; Tamura, Tadayoshi; and Toyoda, Sadao, to Lion Fat & Oil Co., Ltd. Centrifugal pressure nozzle. 3,887,137, Cl. 239-468.000.
Nakamura, Masayoshi: *See*—
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Nakanishi, Michio; Shiroki, Masami; Tahara, Tetsuya; and Araki, Kazuhiko, to Yoshitomi Pharmaceutical Industries, Ltd. Thieno(2,3-E)(1,4)diazepine derivatives. 3,887,543, Cl. 260-239.30B.
Nakano, Mitsuru: *See*—
Kachi, Kenjiro; Takeichi, Morio; Nakamura, Yasumasa; Inomata, Yoichi; and Nakano, Mitsuru, 3,887,274.
Nakayama, Akira; Miyaoka, Senri; and Ohkoshi, Akio, to Sony Corporation. Cathode ray tube. 3,887,837, Cl. 315-368.000.
Nara, Jiyuichi. Apparatus for efficiently alphizing a large mass of a cereal. 3,886,855, Cl. 99-323.110.
Narayan, Thirumurti L.; and Cenker, Moses, to BASF Wyandotte Corporation. Process for the preparation of carbodiimide-isocyanurate foams. 3,887,501, Cl. 260-2.5BF.
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Neitzel, Edwin B.; and Gontarek, Marvin D., to Texas Instruments Incorporated. System for changing seismic detection array lengths. 3,887,897, Cl. 340-7.00R.
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Nelson, Norman A., to FMC Corporation. Downhole safety ball valve. 3,886,967, Cl. 137-495.000.
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Nepela, Daniel A.; and Potter, Robert I., to International Business Machines Corporation. Head assembly for recording and reading, employing inductive and magnetoresistive elements. 3,887,945, Cl. 360-113.000.
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Nesteruk, Edward P., to Engelhard Minerals & Chemicals Corporation. Gold containing compositions for producing luster films on solid substrates. 3,887,383, Cl. 106-1.000.
Neubert, Terry C., to Goodyear Tire & Rubber Company, The. Method of coagulating latices. 3,887,532, Cl. 260-85.100.
Neuhaus, Herbert, to Klockner-Werke AG. Apparatus for purifying in continuous casting silicon- and/or aluminium-killed steel. 3,887,171, Cl. 266-34.00R.
Neuroth, Norbert, to Jenaer Glaswerk Schott & Gen. Solid optical filter having selective wavelength permeability. 3,887,485, Cl. 252-300.000.
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Ninagawa, Chikayoshi; Yoshida, Osamu; and Ashizaki, Shigeya, to Matsushita Electronics Corporation. Fluorescent film for color picture tube and process of preparing same. 3,887,753, Cl. 428-328.000.
Nippon Chemical Industrial Co., Ltd.: *See*—
Matsubara, Hiroyuki; Imamura, Kennosuke; Sogabe, Yuhei; and Aso, Toshio, 3,887,659.
Nippon Concrete Kogyo Kabushiki Kaisha: *See*—
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Nippon Shokubai Kagaku Kogyo Ltd.: *See*—
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Nippon Tsu Shin Kogyo K.K.: *See*—
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Nippon Zeon Co., Ltd.: *See*—
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Nishiguchi, Yuzuru, to Shinko Denshi Kabushiki Kaisha. Device for automatically adjusting fault null point indication of digital scale. 3,887,797, Cl. 235-151.330.
Nishijima, Kiyoaki; and Tanaka, Atsuo, to Allied Chemical Corporation. Stabilized polyamide composition. 3,887,520, Cl. 260-45.75C.
Nishino, Shiro. Refrigerator door switch having vertical drain passage. 3,887,777, Cl. 200-61.690.
Nishiwaki, Kiyoshi: *See*—
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Nittetu Chemical Engineering Limited: *See—*
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North American Philips Corporation: *See—*
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Norton, Richard V.; and Angstadt, Howard P., to Sun Ventures, Inc. Process for recovery of 2,6-dicyanonaphthalene. 3,887,605, Cl. 260-465.00C.

Norwood, Amos, to Sybron Corporation. Haloalkylation agent of aromatic hydrocarbons. 3,887,484, Cl. 252-188.30R.

Noshiro, Atsumi: *See—*
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Nozaki, Kenzie, to Shell Oil Company. Carbonylation process. 3,887,595, Cl. 260-410.600.

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Nyberg, Pauli Unto Juhani: *See—*
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Obergfell, Allen R., to Duo-Fast Corporation. Apparatus for fastening articles. 3,887,113, Cl. 222-146.0HE.

Obermaier, Frank E.; and Scott, Arthur A., to Eaton Corp. Ported valve and sealing means therefor. 3,887,159, Cl. 251-11.000.

O'Callaghan, Gerald F.: *See—*
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Odaka, Minoru, to Mitsui Shipbuilding and Engineering Co. Ltd. Apparatus for disposing longitudinals for constructing hull blocks. 3,886,883, Cl. 114-65.00R.

Odate, Ryoji: *See—*
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O'Farrell, Charles P.; and Kresge, Edward N., to Exxon Research and Engineering Company. Semi-crystalline sulfonated EDPM elastomeric ionomers. 3,887,530, Cl. 260-79.30R.

Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.): *See—*
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Ohki, Seisaku: *See—*
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Ohkubo, Kinji; and Masuda, Takao, to Fuji Photo Film Co., Ltd. Process for producing an organic silver carboxylate. 3,887,597, Cl. 260-414.000.

Ohlawa, Kiyoto: *See—*
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Ohnishi, Yukio: *See—*
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Ohno, Genji; Uchiyama, Tadamitsu; Ohki, Seisaku; and Morohashi, Hishao, to Research and Development Laboratories of Ohno Company Limited. Ink jet recording unit. 3,887,928, Cl. 346-140.000.

Ohto, Michihiro; Noshiro, Atsumi; Takamizawa, Minoru; and Inoue, Yoshio, to Dai Nippon Printing Co., Ltd. Planographic printing plates comprising organic polysiloxanes. 3,886,865, Cl. 101-456.000.

Ohtomo, Koichiro: *See—*
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Ohyama, Yasushi; and Sumitani, Hideo, to Mitsubishi Paper Mills, Ltd. Dye transfer acceleration with polyamine compounds. 3,887,370, Cl. 96-29.00D.

Oil Base Germany, G.m.b.H.: *See—*
Miller, Geo. L.; and Barthel, Horst K. F. (said Barthel assors. to), 3,887,009.

Oil Base, Inc.: *See—*
Miller, Geo. L.; and Barthel, Horst K. F. (said Miller assors. to), 3,887,009.

Oil-Rite Corporation: *See—*
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Ojala, William K., to Ford Motor Company. Two-stage carburetor with improved idle air fuel mixture distribution. 3,887,661, Cl. 261-23.00A.

Okada, Hidehiko: *See—*
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Okada, Hiroshi: *See—*
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Okada, Takashi; and Tsuchiya, Takao, to Sony Corporation. Balanced modulator circuit. 3,887,886, Cl. 332-43.00B.

Okamoto, Eisaku, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument capable of modulation controlling a second keyboard section tone signal in accordance with a first keyboard section tone signal. 3,886,834, Cl. 84-1.170.

Okamura, Seizo; Tagawa, Tomoaki; Yagami, Kazuo; Matsuo, Kazuto; Sakabe, Mitsuo; Sogo, Tsutomu; Korematsu, Mikio, deceased; and by Korematsu, Etsuko, widow and legal successor, to Kohjin Co. Ltd. Polyvinylchloride graft vinyl chloride onto amido backbone and polyvinyl alcohol as film or fiber. 3,887,676, Cl. 264-184.000.

Okamura, Takayuki; and Minatono, Shobu, to Kuraray Co., Ltd. Method of producing maleic anhydride modified polyisoprene rubber. 3,887,527, Cl. 260-78.40D.

Okaya Denki Sangyo Kabushiki Kaisha: *See—*
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Olsen, Willi; Lieske, Manfred; Ehmann, Wolfgang; and Perst, Gerhard, to Siemens Aktiengesellschaft. Arrangement for detecting dielectric breakdowns in metal-clad high-voltage switching and transmission installations. 3,887,915, Cl. 340-415.000.

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Onahama Seiren Kabushiki Kaisha: *See—*
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Onesta, Roberto Carlo. Device to facilitate the clearance of a blocked drain. 3,886,603, Cl. 4-255.000.

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Ono, Minoru; and Momoi, Toshimitu, to Hitachi, Ltd. Method of manufacturing semiconductor device with nitride oxide double layer film. 3,887,407, Cl. 156-11.000.

Oostenbrink, Albertus Anthony, to Wavin B.V. Pipe part with a widened end. 3,887,674, Cl. 264-94.000.

Ordinartsev, Jury Nikolaevich: *See—*
Tseitlin, Aron Yakovlevich; Martynov, Oleg Viktorovich; Ordinartsev, Jury Nikolaevich; Ordinartsev, Vladimir Nikolaevich; Tishkin, Evgeny Pavlovich; Tikhonov, Sergei Sergeevich; and Belousov, Alexeevich Vladimir, 3,886,996.

Ordinartsev, Vladimir Nikolaevich: *See—*
Tseitlin, Aron Yakovlevich; Martynov, Oleg Viktorovich; Ordinartsev, Jury Nikolaevich; Ordinartsev, Vladimir Nikolaevich; Tishkin, Evgeny Pavlovich; Tikhonov, Sergei Sergeevich; and Belousov, Alexeevich Vladimir, 3,886,996.

O'Reilly, Daniel W.; and O'Reilly, Joseph D. Attachments for unloading devices. 3,887,153, Cl. 239-676.000.

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Original Hanau Quarzlampen GmbH: *See—*
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Ormat Turbines (1965) Ltd.: *See—*
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Osman, Mohammed A.; and Kaib, Charles L., to Pullman Incorporated. Tunnel kiln firing of carbon products. 3,887,437, Cl. 202-117.000.

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Osterburg, Gunter: *See—*
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Ostermann, Max, to W. & M. Ostermann. Device for applying filamentary material about a workpiece. 3,886,720, Cl. 57-13.000.

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Oswald, Alexis A.; and Valint, Paul L., to Ciba-Geigy AG. O-Alkyl-S-alkyl-S-[1,2-bis(alkoxycarbonyl)ethyl]dithiophosphates. 3,887,658, Cl. 260-942.000.

Ota, Susumu; and Aihara, Ryuzo, to Nihon Denshi Kabushiki Kaisha. Pulsed field emission type electron gun. 3,887,839, Cl. 315-383.000.

Ota, Takayuki: *See*—
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Otaki, Takashi; and Aihara, Yoshiaki, to Mitsubishi Jukogyo Kabushiki Kaisha. Compressor construction. 3,887,304, Cl. 417-363.000.

Otis Engineering Corporation: *See*—
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Sizer, Phillip S.; and Grimmer, George G., 3,887,010.

Oughton, John Francis: *See*—
Crisp, Harold Alfred; Oughton, John Francis; Sharp, Christopher John; and Wilkinson, Peter Alfred, 3,887,551.

Owens, Abner, Jr., to Bendix Corporation, The. Electromagnetic deflection display system including dual mode deflection amplifiers and output power limited supplies. 3,887,829, Cl. 315-411.000.

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Fry, William L.; and Sacha, Stanislav A., 3,887,285.
Jenkins, Charles W., 3,887,350.
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OY Tampella AB: *See*—
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Oyama, Masaji: *See*—
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Ozaki, Masahiko: *See*—
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P. R. Mallory & Co. Incorporated: *See*—
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Pacault, Pierre Henri, to Babcock-Atlantique Societe Anonyme. Steam power stations. 3,886,749, Cl. 60-652.000.

Packaging Techniques, Inc.: *See*—
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Pagel, Warren C., to Minnesota Mining and Manufacturing Company. Bonding film. 3,887,639, Cl. 260-836.000.

Paginton, Philip Norman: *See*—
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Pail, Daniel R.: *See*—
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Panek, George J.; and McCrea, Michael E., to International Telephone and Telegraph Corporation. Electrical connector. 3,887,257, Cl. 339-45.00M.

Paoletti, Xavier. Swivelling toothbrush. 3,886,618, Cl. 15-172.000.

Papp, Istvan: *See*—
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Parker, Delmer Gene, to Xerox Corporation. Method for temperature stabilizing photoreceptors. 3,887,367, Cl. 96-1.00R.

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Parks, Walter K., to General Electric Company. Multi-speed motor. 3,887,854, Cl. 318-224.00A.

Parratt, Noel James: *See*—
Schmid, Eduard; Nascher, Reinold; Egli, Rene; Parratt, Noel James; and Gooding, Ronald William, 3,887,429.

Parsons, Charles O. Ski rope retrieving device. 3,886,888, Cl. 114-235.0WS.

Pasternak, Stephen F., to Peerless of America, Incorporated. Method of making a finned heat exchanger. 3,886,639, Cl. 29-157.30A.

Pastrick, Benjamin George, to International Business Machines Corporation. Card holder. 3,887,055, Cl. 197-135.00R.

Patrick, James G., to Bechtel International Corporation. Apparatus and method for cutting and breaking rock. 3,887,236, Cl. 299-10.000.

Patrikeev, Veniamin Vasilievich; Malkina, Anna Davydovna; and Kartsivadze, Amiran Ilich. Method of crystallization of water in supercooled clouds and fogs and reagent useful in said method. 3,887,580, Cl. 252-319.000.

Patzelt, Helmut: *See*—
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Paugh, George W., to Ralston Purina Company. Continuous cooker. 3,886,856, Cl. 99-443.00C.

Paul, Howard C.; and Tuzson, John J., to Borg-Warner Corporation. Engine torque sensor device. 3,886,817, Cl. 74-861.000.

Pauley, Reginald W., to Ingersoll-Rand Company. Power wrench with rotatively mounted motor. 3,886,822, Cl. 81-52.40R.

Paulus, Jean; and Bourg, Christian Pierre, to C. P. Bourg. Sheet collator. 3,887,176, Cl. 270-58.000.

Pavia, Rafael Saurina. Article of footwear. 3,886,674, Cl. 36-38.000.

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Pearce, Denis N., to Illinois Tool Works Limited. Trickle irrigation emitter. 3,887,139, Cl. 239-542.000.

Pearce, Ronald A.; and Herrmann, Thomas R., to Coors Container Company. Method of making a press tab container end from a metallic shell. 3,886,881, Cl. 113-121.00C.

Pecota, Walter, to Wagner Electric Corporation. No-relight cigar lighter socket. 3,887,789, Cl. 219-265.000.

Peel, Mervyn Evan: *See*—
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Pelsue, Thurman A. Air dryer jacket for underground electrical cables. 3,886,669, Cl. 34-107.000.

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Pennington, James R.: *See*—
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Peover, Cyril: *See*—
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Perrotin, Guy; and Anselmini, Jean-Pierre, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des procedes Georges Claude. Processes for the production of nitrogen and oxygen. 3,886,758, Cl. 62-30.000.

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Peters, Philip H., Jr., to Environment/One Corp. Metal base cookware induction heating apparatus having improved control circuit using infra-red temperature sensor. 3,887,781, Cl. 219-10.490.

Peterson, Richard H. Tremulant and chorus generating system for electrical musical instruments. 3,886,835, Cl. 84-1.240.

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Pfeiffer, Gottfried; Wellhauser, Robert; and Gehra, Hartmut, to Herta KG Karl Schweisfurth. Process for the extraction of proteins, other nitrogenous substances and lipids from bones. 3,887,717, Cl. 426-264.000.

Pfiffner, Albert: *See*—
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Rundberg, Eric G. S., Jr.; Johnson, William R., Jr.; and Grubbs, Harvey J., 3,887,603.

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Phillips, Malcolm E., Jr., to AMF Incorporated. Apparatus for metering and shaping materials. 3,887,315, Cl. 425-209.000.
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Pierzchala, Chester E., to Reliable Electric Company. Clamping arrangement and method. 3,887,895, Cl. 339-14.00R.
Pillet, Jean, to Rhone-Poulenc, S.A. Method for forming a composite object of acrylic resin and silicone elastomer. 3,887,669, Cl. 264-16.000.
Pinckaers, B. Hubert, to Honeywell Inc. Control system comprising differential amplifier with dual current comparator having two outputs separated by a deadband. 3,887,000, Cl. 165-26.000.
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Pitts, Charles A., to Dow Chemical Company, The. Fluid retainer setting tool. 3,887,006, Cl. 166-124.000.
Plantevin, Bruno; and Touchard, Jacques, to Regie Nationale des Usines Renault. Installation for automatic polishing. 3,886,690, Cl. 51-80.00A.
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Plastic Forming Company, Inc., The: *See—*
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Plastics Engineering Company: *See—*
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Platz, Edward A. Sub-surface root fertilizer and probe. 3,886,874, Cl. 111-7.400.
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Plentovich, Jack; Winslow, Charles Ellis, Jr.; and Kise, Mearl A., to Virginia Chemicals Inc. Production of sodium hydrosulfite from formates. 3,887,695, Cl. 423-515.000.
Plett, Edelbert G., to Control Data Canada, Ltd. Apparatus for determining the gross thrust of a jet engine. 3,886,790, Cl. 73-117.400.
Plocher, Werner; Ihlingen, Horb; Kuhl, Franz; and Huttermann, Bernhard, to Jurid Werke GmbH; and Maschinenfabrik Lauffer & Butscher. Pressing apparatus. 3,887,317, Cl. 425-257.000.
Ploeger, Walter, Jr.; and Bishop, John W. H., to Controlled Printout Devices, Inc. Method of making printing ribbon spool. 3,887,727, Cl. 427-177.000.
Plotkin, Steven R.: *See—*
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Plowman, Richard E.: *See—*
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Pollock, Glenn E.; Henderson, Milton E.; and Donaldson, Ralph W., Jr., to United States of America, National Aeronautics and Space Administration. Gas chromatograph injection system. 3,887,345, Cl. 55-386.000.
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Porter, Lawrence C., to Upjohn Company, The. Apparatus for and method of producing continuous foamed plastic bunstock. 3,887,670, Cl. 264-41.000.
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Rainer, Norman B.; and Wilson, Peter Allen, to Philip Morris Incorporated. Microporous styrene polymers and method of making same. 3,887,730, Cl. 427-244.000.

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Ramstedt, Clarence F., to United States of America, Navy. Active sonar image perception. 3,887,896, Cl. 340-3.00R.

Ranghelli, Joseph C.; and Perrotti, Emmanuel J., to International Telephone and Telegraph Corporation. Linearly polarized phased antenna array. 3,887,925, Cl. 343-795.000.

Rao, V. Durga Nageswar, to Ford Motor Company. Rubbing seal material for ceramic heat exchanger. 3,887,201, Cl. 277-96.00R.

Rasmussen, Jerome J. M., to Union Carbide Corporation. Shirred tubular food casings having a barrier coating. 3,886,979, Cl. 138-118.100.

Rasmussen, Jerome Jordan Michael; and Voo, David, to Union Carbide Corporation. Method for producing flexible casings and the casings obtained therefrom. 3,887,713, Cl. 426-135.000.

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Reed, Robert D.; Zink, John Smith; Schwartz, Robert F.; Glomm, Horst; Corble, John C.; and Koons, Harold F., to John Zink Company. Method for non-polluting combustion of waste gases. 3,887,324, Cl. 431-5.000.

Reed, Thomas D.; and Winget, Wayne A., to Rockwell International Corporation. Low pass filter apparatus. 3,887,874, Cl. 328-167.000.

Reese, Johannes; and Kraft, Kurt, to Reichhold-Albert-Chemie-Aktiengesellschaft. Process for preparing triketoimidazolidines and product. 3,887,507, Cl. 260-37.00N.

Reese, Walter J., to PPG Industries, Inc. Method of packaging glass strand. 3,887,347, Cl. 65-3.000.

Regan, Barrie F. Cutting wheel. 3,886,925, Cl. 125-15.000.

Regehr, Ulrich. Contact body for the transfer of heat and/or substances. 3,887,664, Cl. 261-112.000.

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Remond, Jean-Pierre; Thebault, Jean-Robert; and Vitat, Jean-Claude, to Rhone-Progil. Drying of articles. 3,886,668, Cl. 34-9.000.

Renfrow, William Neil. Self aligning stuffing box. 3,887,196, Cl. 277-2.000.

Rentel, Alfred: *See*—
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Renzullo, Andrew; and Suokko, George D., to Polaroid Corporation. Leather laminate for camera housing. 3,886,986, Cl. 150-52.00J.

Republic of France: *See*—
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Reuterhall, Alf Ragnar: *See*—
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Rey, Jean: *See*—
Serre, Hubert; and Rey, Jean, 3,887,705.

Reynolds, Lionel Arthur; and James, David Richard, to A. F. Hydraulics Limited. Hydraulic percussive implement. 3,887,019, Cl. 173-134.000.

Rhea, Robert: *See*—
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Rheinstahl AG: *See*—
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Rich, Hubert; and Rosas, Robert R., to Mattel, Inc. Simulated campstove toy. 3,886,680, Cl. 46-39.000.

Richardson, Robert Harold; and Vokoun, Edward Richard, to Harris-Intertype Corporation. Static eliminator. 3,887,843, Cl. 317-2.00F.

Richey, Preston: *See*—
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Richle, Rolf: *See*—
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Riegler, Ernst, to Vereinigte Osterreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft. Slide-articulation bearing for tiltable converters. 3,887,248, Cl. 308-15.000.

Rieth, Alois: *See*—
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Rigassi, Norbert: *See*—
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,887,586.

Rigaux, Jean-Claude: *See*—
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Leir, Charles M., 3,887,568.

Riphagen, Reinhard. Iron work for horizontal displacable wings of windows, doors or similar things. 3,886,685, Cl. 49-209.000.

Rizzo, Victor L., to Upjohn Company, The. N-hydrocarbylsulfenyl-N-alkyl-N'-arylformamidines. 3,887,619, Cl. 260-564.0RF.
Robbins, Ernest Aleck; Sucher, Robert William; Schuldt, Erich Henry, Jr.; Sidoti, Daniel Robert; Seeley, Robert Dudley; and Newell, Jon Albert, to Anheuser-Busch Incorporated. Yeast protein isolate with reduced nucleic acid content and process of making same. 3,887,431, Cl. 195-5.000.
Robert Bosch G.m.b.H.: *See—*
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Roberts, Maurice P.; and Clendenen, Harold K., to TRW Inc. Power steering system. 3,886,849, Cl. 92-168.000.
Robertshaw Controls Company: *See—*
Murrell, Donald K., 3,886,968.
Robertson, Donald Hancher, to United States of America, Energy Research and Development Administration. Industrial technique. 3,887,339, Cl. 55-66.000.
Robins, Milton, to Packaging Techniques, Inc. Keyed removable door lock. 3,886,771, Cl. 70-90.000.
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McCloskey, Albert R., 3,887,246.
Prange, Charles J., 3,887,163.
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Winfield, Mason C., Jr., 3,886,804.
Rodler, Hans. Electrodiagnostic apparatus. 3,886,931, Cl. 128-2.10R.
Rodway, Ronald Ernest; and Cookson, Ronald Frederick, to Aspro Nicholas Ltd. 2,3-Dihydroimidazo-isoquinolines. 3,887,566, Cl. 260-288.00R.
Rohlfing, Raymond G., to Phillips Petroleum Company. Preventing plugs in transfer conduits. 3,887,529, Cl. 260-79.000.
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Rollband, Ernest J. Dual handle construction for caskets. 3,886,625, Cl. 16-112.000.
Romanelli, Michael G., to Exxon Research and Engineering Company. Preparation of unsaturated alcohols and ethers. 3,887,627, Cl. 260-632.00R.
Romantschuk, Hakan Wilhelm; and Nyberg, Pauli Unto Juhani, to OY Tampella AB. Device for dissolving a poorly soluble gas in a liquid. 3,887,660, Cl. 261-91.000.
Romine, Donald J.: *See—*
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Rosas, Robert R.: *See—*
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Rosemund, Walter R.: *See—*
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Rosenberger, Siegfried; and Schwarzenbach, Kurt, to Ciba-Geigy Corporation. Salicyloyl-acyl-hydrazines. 3,887,518, Cl. 260-45.9NC.
Rosengren, Knut Tage Lennart. Loading yard with wharves. 3,886,614, Cl. 14-71.000.
Rosenwald, Gary W., to Cities Service Oil Company. Storm choke. 3,887,005, Cl. 166-72.000.
Roser, Herbert: *See—*
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Ross, Jaffray Stuart: *See—*
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Ross, James A.; and Harris, Bert C., to Rohr Industries Inc. Railway truck magnetic suspension. 3,886,871, Cl. 105-157.00R.
Rostaing, Paul: *See—*
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Rothstein, Sven-Olle H.; and Astrom, Sture, to Frigoscandia Contracting AB. Apparatuses for freezing articles of food and similar products. 3,886,762, Cl. 62-380.000.
Roubloff, Alexander D., deceased; and Peiser, Adolf E., to Colt Industries Operating Corp. Tool changer mechanism. 3,886,652, Cl. 29-568.000.
Rouch, Keith E., to Allis-Chalmers Corporation. Pivoted pad bearing apparatus and method for bidirectional rotation. 3,887,245, Cl. 308-1.00R.
Rouch, Keith E., to Allis-Chalmers Corporation. Journal bearing for supporting both radial loads and axial thrust loads. 3,887,249, Cl. 308-73.000.
Rounds, Hugh G.: *See—*
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Rowekamp, Richard J. Combination solar water heater and chiller. 3,886,998, Cl. 165-2.000.
Royal Industries, Inc.: *See—*
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Rozema, Arthur L.; Saik, John D.; and Arisman, Mervin B., to CTS Corporation. Variable resistance slide control. 3,887,892, Cl. 338-183.000.
Rubin, Randolph D. Tricolor additive system for a color head. 3,887,279, Cl. 355-38.000.
Ruble, Emerson J., to Portec, Inc. Rail fastener. 3,887,128, Cl. 238-349.000.
Rudd, Floyd R.; and MacKenzie, George D., to TRW Inc. Helical resistor. 3,887,894, Cl. 338-264.000.
Rue, Larry M.; Freis, Richard E.; and Ossanna, Oliver A., to Economics, Laboratory, Inc. Detergent compositions and methods of making and using them. 3,887,480, Cl. 252-135.000.
Rueb, Carl E. Gun sight attachment. 3,886,667, Cl. 33-233.000.
Ruegg, Rudolf: *See—*
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Rundberg, Eric G. S., Jr.; Johnson, William R., Jr.; and Grubbs, Harvey J., to Philip Morris Incorporated. Menthol-release compounds. 3,887,603, Cl. 260-463.000.
Rupp, Walter: *See—*
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Ruppert, Georg: *See—*
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Ruzic, Ivan. Rotary internal combustion engine. 3,886,908, Cl. 123-8.310.
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Ryan, George R., to Abbott Laboratories, Inc. Blood collecting assembly. 3,886,930, Cl. 128-2.00F.
Ryu, Dewey D. Y.: *See—*
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S. A. Alba: *See—*
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Saario, Pekka Juhani. Circulating air oven. 3,887,266, Cl. 432-152.000.
Sacha, Stanislav A.: *See—*
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Sadagopan, Varadachari: *See—*
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Enger, Rolf; Piene, Kristian; Skreien, Nils; Saethre, Audun; and Thorslund, Jan-Erik, 3,887,359.
Safer, Michael B.; and Menegos, Andrew J., to Avtron Manufacturing, Inc. Surge tester for testing an electrical winding and including voltage comparison means. 3,887,866, Cl. 324-51.000.
Safer, Michael B.; and Menegos, Andrew J., to Avtron Manufacturing, Inc. Surge tester for detecting a ground fault in an electrical winding. 3,887,867, Cl. 324-51.000.
Sagami Chemical Research Center: *See—*
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Salomon, Georges Pierre Joseph, to S.A. Francois Salomon & Fils. Security bindings for skis. 3,887,206, Cl. 280-11.35N.
Samaras, John. Goal shield. 3,887,181, Cl. 273-1.00B.

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Santer, James O.: *See*—
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Santini, Mario P., to Chrysler Corporation. Thermostatically operated suction throttling valve. 3,886,761, Cl. 62-217.000.

Sarges, Reinhard: *See*—
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Sarstedt, Walter. Device for the extraction of blood. 3,886,928, Cl. 128-2.00F.

Saso, Martin P. Modified bowling game and apparatus therefor. 3,887,183, Cl. 273-41.000.

Sato, Arkira: *See*—
Shiba, Keisuke; Hinata, Masanao; Ohi, Reiichi; Sato, Arkira; Yamasue, Koutarou; and Kondo, Tokiharu, deceased, 3,887,380.

Sato, Hisatake: *See*—
Tsuchiya, Shozo; Hayashi, Hideo; and Sato, Hisatake, 3,887,641.

Sato, Wasuke; and Uemura, Osamu, to Showa Denko Kabushiki Kaisha. Apparatus and method for manufacturing tubular film of thermoplastic resin. 3,887,673, Cl. 264-89.000.

Sato, Yukio; Shigemori, Youjiro; Mitumori, Yoshio; and Suzuki, Tadashi, to Star Seimitsu Kabushiki Kaisha (Star Mfg. Co., Ltd.). Contactless buzzer. 3,887,914, Cl. 340-384.00R.

Saunders, James Edwin: *See*—
Mills, Noel; Balmford, David Ernest Hall; and Saunders, James Edwin, 3,887,296.

Savage, John M., Jr. Light emitting diode device. 3,887,803, Cl. 240-151.000.

Sawatzky, John Walter, to Raymond Lee Organization, Inc., The. Portable pipe clamp. 3,887,034, Cl. 182-129.000.

Sawyer, Philip N., to Meadox Medicals, Inc. Non-thrombogenic catheter. 3,886,947, Cl. 128-348.000.

Scala, Anthony: *See*—
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Schaaf, Thomas K.; and Corey, Elias J., to Pfizer Inc. Synthesis of prostaglandins of the one-series. 3,887,587, Cl. 260-345.800.

Schade, Otto Heinrich, Jr., to RCA Corporation. Transistor series amplifier. 3,887,878, Cl. 330-13.000.

Schaeffer, Warren I. Cytological cell disruption apparatus. 3,887,144, Cl. 241-301.000.

Schenk, Wolfgang: *See*—
Thurn, Friedrich Martin; Meyer-Simon, Eugen; Will, Werner; Schmidt, Franz; Schenk, Wolfgang; and Wurmb, Rolf, 3,887,602.

Schering Aktiengesellschaft: *See*—
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Scherrer, Robert John. Device for teaching musical note recognition. 3,886,838, Cl. 84-470.000.

Schick, Rupert: *See*—
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Schindl, Klaus P.: *See*—
Merstallinger, Kurt; and Schindl, Klaus P., 3,887,283.

Schlamersdorf, John Michael, to Miles Laboratories, Inc. Apparatus for treating particulate matter while in a fluidized state. 3,886,895, Cl. 118-7.000.

Schlein, Allen P., to Schlein. Louis Charles. Surgically implantable total ankle prosthesis. 3,886,599, Cl. 3-1.000.

Schlein, Louis Charles: *See*—
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Schloemann-Siemag Aktiengesellschaft: *See*—
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Schlumberger Limited: *See*—
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Schmid, Eduard; Nascher, Reinold; Egli, Rene; Parratt, Noel James; and Gooding, Ronald William, to Lonza, Ltd. Device for untangling and dispersing fibrous materials. 3,887,429, Cl. 162-261.000.

Schmidt, Franz: *See*—
Thurn, Friedrich Martin; Meyer-Simon, Eugen; Will, Werner; Schmidt, Franz; Schenk, Wolfgang; and Wurmb, Rolf, 3,887,602.

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Schmidt, William: *See*—
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Schmitt, Charles R.: *See*—
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Schneider, Wolfgang; and Minchak, Robert J., to B. F. Goodrich Company, The. Interpolymers of 5,8-dimethyl-1,4,9-decatriene and/or 4,8-dimethyl-1,4,9-decatriene with at least one alphaolefin containing 2 to 6 carbon atoms. 3,887,531, Cl. 260-80.780.

Schnirel, David R.; Zimmerman, William T.; Barsell, Birger E.; and Christensen, Charles M., to United States of America, Navy. Man overboard package. 3,886,612, Cl. 9-14.000.

Schnurr, Robert H.: *See*—
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Schoenrock, Karlheinz W. R.; Richey, Preston; and Rounds, Hugh G., to Amalgamated Sugar Company, The. Process for the decalcification sugar beet juice. 3,887,391, Cl. 127-46.00A.

Scholl, Rolland Dale; Coleman, Donald Frederick; Johnson, Edward Lawrence; and Streight, William Edward, to Caterpillar Tractor Co. Automatic levelling system for earth working blades and the like. 3,887,012, Cl. 172-4.500.

Schonowsky, Hubert: *See*—
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Schoonman, Willem, to Lummus Company, The. Air-cooled heat exchanger with after-condenser. 3,887,002, Cl. 165-113.000.

Schottey, Jean: *See*—
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Schottmiller, John C.; Ryan, Francis W.; and Wood, Charles, to Xerox Corporation. Composition. 3,887,368, Cl. 96-1.500.

Schreyer, Gerd; Theissen, Ferdinand; Weiberg, Otto; and Weigert, Wolfgang, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for regenerating noble metal catalyst for the synthesis of hydrogen peroxide according to the anthraquinone process. 3,887,490, Cl. 252-414.000.

Schuchman, Frederick E. Elastic surface exposure wrapper for soap cakes. 3,886,987, Cl. 150-52.000.

Schuil, Roelof Egbert: *See*—
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Schuldt, Erich Henry, Jr.: *See*—
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Schulte-Elte, Karl-Heinrich, to Firmenich S.A. Cyclic unsaturated alcohols. 3,887,625, Cl. 260-617.00R.

Schulze, Reinhold, to Norddeutsche Affinerie. Method of preventing supersaturation of electrolytes with arsenic, antimony and bismuth. 3,887,448, Cl. 204-130.000.

Schummer, Arthur: *See*—
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Schurman, Peter T., to Plastic Forming Company, Inc., The. Method of molding and assembling a hinged plastic container. 3,886,645, Cl. 29-434.000.

Schuster, Nick A., to Schlumberger Limited. Measuring apparatus. 3,887,805, Cl. 250-264.000.

Schwantje, Gerd: *See*—
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Schwarcz, Jose, to S. A. Alba. Copolymerizate of unsaturated polyester, unsaturated monomer and carboxy containing monomer. 3,887,645, Cl. 260-861.000.

Schwartz, Leonard; and Chin, Edward G. H., to Singer Company, The. Phased array scanning antenna. 3,887,926, Cl. 343-816.000.

Schwartz, Robert F.: *See*—
Reed, Robert D.; Zink, John Smith; Schwartz, Robert F.; Glomm, Horst; Corble, John C.; and Koons, Harold F., 3,887,324.

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Schwieter, Ulrich: *See*—
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Schwieterman, Roman A., to Armco Steel Corporation. Metallic coating method. 3,887,721, Cl. 427-45.000.

SCM Corporation: *See*—
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Scope Incorporated: *See*—
Williams, Richard E., 3,887,792.

Scott, Arthur A.: *See*—
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Scott, Paul R.; Chavez, Victor J.; and Kruka, Vitold R., to Shell Oil Company. Core flow nozzle. 3,886,972, Cl. 137-602.000.

Scott Port-A-Fold, Inc.: *See*—
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Scott, Robert H.; and Gaulding, Dan L., to Celanese Corporation. Inhibition of corrosion in sulfuric acid solutions. 3,887,488, Cl. 252-389.00A.

Scovil, Henry Evelyn Derrick: *See*—
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SDS-Electro GmbH: *See*—
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Seary, Eugene G. Injection molding apparatus. 3,887,312, Cl. 425-3.000.

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Busch, Johannes; Roser, Herbert; and Sedlacek, Hugo, 3,886,613.

Seebach, Dieter; and Leitz, Herbert, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of 2-phenyl-3-nitrobutyric acid compounds. 3,887,617, Cl. 260-559.00R.

Seelbach, Bernard H., to K. C. Seelbach Co. Inc. Method and apparatus for processing foodstuffs. 3,887,716, Cl. 426-231.000.

Seeley, Dunham Briggs: *See—*
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Seeley, Robert Dudley: *See—*
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Seibel, Richard Roy; and Rhea, Robert, to Seibel & Seibel Enterprises. Condensation free mirror. 3,887,788, Cl. 219-219.000.

Seibel & Seibel Enterprises: *See—*
Seibel, Richard Roy; and Rhea, Robert, 3,887,788.

Seid, Eugene: *See—*
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Seiger, Harvey N., to Textron Inc. Method for producing electrical energy with consumable aluminum anode. 3,887,399, Cl. 136-86.00A.

Seitz-Werke G.m.b.H.: *See—*
Uth, Gerhard; and Rentel, Alfred, 3,886,982.

Sellers, Jerry W., to Rockwell International Corporation. Electrically powered grass trimmer. 3,886,716, Cl. 56-17.400.

Selman, Charles M., to Phillips Petroleum Company. Diene-lactam block copolymers. 3,887,643, Cl. 260-857.00D.

Selmek, Emil C., to Ford Motor Company. Universal joint. 3,886,766, Cl. 64-17.00R.

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Parker, Konrad; and Shah, Hasmukhlal M., 3,887,732.

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Crisp, Harold Alfred; Oughton, John Francis; Sharp, Christopher John; and Wilkinson, Peter Alfred, 3,887,551.

Sharpe, Claude A., to Bendix Corporation, The. Freeze circuit for aircraft radio navigation systems. 3,887,872, Cl. 325-21.000.

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Champ, Robert Bruce; and Shattuck, Meredith David, 3,887,366.

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Shearer, Harry D.; and Dalabakis, Eli J., to NCR Corporation. Digital signal leveling device. 3,887,875, Cl. 328-168.000.

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Ayers, Ray R.; and Seymour, Errol V., 3,886,750.
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Quist, Bernardus B.; and Zuiderwijk, Jacobus J. M., 3,887,385.
Scott, Paul R.; Chavez, Victor J.; and Kruka, Vitold R., 3,886,972.

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Shields, James E.; and Smithwick, Edward L., Jr., to Eli Lilly and Company. Process for selectively cleaving carboxyl protecting groups from multi-carboxyl peptides or amino acids and compounds useful therein. 3,887,538, Cl. 260-112.500.

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Sato, Yukio; Shigemori, Youjiro; Mitumori, Yoshio; and Suzuki, Tadashi, 3,887,914.

Shigeyasu, Motoo; and Kuihara, Kenzo, to Maruzen Oil Co., Ltd.; and Matsuyama Petrochemicals Inc. Process for preparing high purity terephthalic acid. 3,887,612, Cl. 260-524.00R.

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Shimadzu Seisakusho Ltd.: *See—*
Kurita, Takashi; Yamamoto, Hiroshi; and Makabe, Hideki, 3,887,281.

Shimaro Industrial Co., Ltd.: *See—*
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Shimizu, Masanao: *See—*
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Shimosaka, Yukio; Ozaki, Masahiko; and Negi, Jiro, to Japan Exlan Company Limited. Process for refining aqueous solution of thiocyanate containing impurities. 3,887,688, Cl. 423-366.000.

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Shin-Shirasuna Electric Corporation: *See—*
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Shinko Denshi Kabushiki Kaisha: *See—*
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Shiota, Toshiaki: *See—*
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Nakanishi, Michio; Shiroki, Masami; Tahara, Tetsuya; and Araki, Kazuhiko, 3,887,543.

Shiseido Co., Ltd.: *See—*
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Showa Denko Kabushiki Kaisha: *See—*
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Sidoti, Daniel Robert: *See—*
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Siemens Aktiengesellschaft: *See—*
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Sigmatex AG Basel: *See—*
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Sih, Charles J., to Wisconsin Alumni Research Foundation. Process for preparing dl-strigol. 3,887,547, Cl. 260-240.00R.

Simon, Ernst-Ulrich; and Ullrich, Horst, to VDO Adolf Schindling AG. Brake lining thickness monitoring device. 3,887,040, Cl. 188-1.00A.

Simon, Joseph A. Process for cold forming a metal tube with an inwardly thickened end. 3,886,649, Cl. 228-112.000.

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Singleton, Thomas C.: *See—*
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Sizer, Phillip S.; and Grimmer, George G., to Otis Engineering Corporation. Well flow control method. 3,887,010, Cl. 166-314.000.

Skaggs, Frank Lee, to Texas Instruments Incorporated. Photon-multiplier imaging system. 3,887,810, Cl. 250-333.000.

Skau, John E. Container box closure. 3,887,124, Cl. 229-7.0SC.

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SKF Industrial Trading and Development Company B.V.: *See—*
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Skorupsky, Boris Pavlovich: *See—*
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Smashey, Russell W.; and Wukusick, Carl S., to General Electric Company. Nickel-base superalloy cast article. 3,887,363, Cl. 75-171.000.

Smith, Alan Martin: *See—*
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Smith, David C., to United Aircraft Corporation. Electric discharge laser with electromagnetic radiation induced conductivity enhancement of the gain medium. 3,887,882, Cl. 331-94.50P.

Smith, Edwin W. Electronic status and control board. 3,887,913, Cl. 340-381.000.

Smith, Gordon F., to Helistrand, Inc. Double locking security apparatus. 3,886,770, Cl. 70-18.000.

Smith, Graham C.: *See—*
Kirby, Peter; Isaac, Eirlys R.; and Smith, Graham C., 3,887,472.

Smith, Matthew S.; and Filippi, Ernest A. Rocket powered round. 3,886,841, Cl. 89-1.00F.

Smith, Randall E. Self-cleaning filter. 3,887,344, Cl. 55-294.000.

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Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
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Societe d'Exploitation des Brevets Neiman: *See—*
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Societe Generale de Brevets Industriels et Chimiques: *See—*
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Societe Suisse pour l'Industrie Horlogere Management Services S.A.: *See—*
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Solomon, Paul. Disposable pattern, composition for investment casting. 3,887,382, Cl. 106-38.800.

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Sommeria, Marcel R., to Hyper-Loop, Inc. Press feeder control apparatus. 3,887,122, Cl. 226-136.000.

Song, John, to American Cyanamid Company. Hindered tris (metahydroxybenzylthio)-s-triazine antioxidants. 3,887,516, Cl. 260-45.80N.

Sony Corporation: *See—*
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Spanel, Abram N. Telephone adapter. 3,887,771, Cl. 179-1.00C.

Sparso, Viggo, to Andersen, Hans Christian. Apparatus for the closing of the toe of a circularly knit stocking. 3,886,876, Cl. 112-27.000.

Special Metals Corporation: *See—*
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Spector, George: *See—*
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Speer, Lawrence, to Vinyltron Corporation. Method for repairing plastic materials. 3,887,413, Cl. 156-94.000.

Spenadel, Lawrence: *See—*
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Spencer, Gordon R., to Raytheon Company. Cathode ray tube with magnetic beam alignment means. 3,887,830, Cl. 313-443.000.

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Spiller, Eberhard A., to International Business Machines Corporation. Low-loss reflection coatings using absorbing materials. 3,887,261, Cl. 350-1.000.

Spooner, Edward. Swimming pool equipment carrying case. 3,887,103, Cl. 220-20.000.

Sprague, Mary. Neckband applicator. 3,886,935, Cl. 128-57.000.

Spratt, Brendan J.; and Lunsden, James C., to Bendix Corporation, The. Adaptive rate limiter. 3,887,921, Cl. 343-106.00R.

Stabley, Bernard D.: *See—*
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Stadler, Henry L.; Tien, Tseng-ying; Esper, Michael J.; and Romine, Donald J., to Ford Motor Company. Gas sensor and method of manufacture. 3,886,785, Cl. 73-23.000.

Stahl, Horst; Vorbach, Guenther; Brunnthaler, Erich; Hezel, Wolfgang; and Flath, Wolfgang, to Siemens Aktiengesellschaft. Housing for electrically operated typewriters and similar machines. 3,887,057, Cl. 197-186.00B.

Stahle, Helmut; Koppe, Herbert; Kummer, Werner; and Hoefke, Wolfgang, to Boehringer Ingelheim GmbH. 5-Oxo-2,3-dihydroimidazo(1,2-a)-s-triazines. 3,887,552, Cl. 260-249.500.

Stahnecker, Erhard; Ruppert, Georg; Moeller, Rolf; Schick, Rupert; and Zuern, Ludwig, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Manufacture of saddle-shaped discs from expandable styrene polymers. 3,887,672, Cl. 264-51.000.

Stance Industries Inc.: *See—*
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Standun, Inc.: *See—*
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Stanev, Tzvyatko Penchev, to DSO "Bulgarski Darjavni Jeleznitzi". Railway vehicle-load measuring method and device. 3,887,022, Cl. 177-146.000.

Stanley, Carlyle Eugene. Golf practice device. 3,887,193, Cl. 273-186.00R.

Stanwood, David A., to Baker Hydro, Inc. Wave quenching device. 3,886,602, Cl. 4-172.000.

Star Seimitsu Kabushiki Kaisha (Star Mfg. Co., Ltd.): *See—*
Sato, Yukio; Shigemori, Youjiro; Mitumori, Yoshio; and Suzuki, Tadashi, 3,887,914.

Stark, Donald R.; and Hirsch, Irving A., to Boeing Company, The. Control system for hydrofoil. 3,886,884, Cl. 114-66.50H.

Staub, Fred W.; and Kosky, Philip G., to General Electric Company. Evaporative cooling system employing liquid film evaporation from grooved evaporator surface and vapor push pump for circulating liquid. 3,887,759, Cl. 174-15.00R.

Stauffer Chemical Company: *See—*
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Shim, Kyung S., 3,887,656.

Steelman, Gerald E. Power generating device. 3,887,817, Cl. 290-43.000.

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Stelzmuller, Franz, to Von Roll A.G. Automatic feed block molding press for granular materials. 3,887,685, Cl. 425-260.000.

Stenprint Limited: *See—*
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Stephenson, Leslie: *See—*
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Sterff, Wilhelm, to Matsushita Electric Works, Ltd.; and SDS-Electro GmbH. Delay circuit for a relay. 3,887,850, Cl. 317-141.00S.

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Sternberg, Stanley P.; Young, James E.; and Lennington, John W., to Bergishagen & Associates. Method and system for the infrared analysis of gases. 3,887,473, Cl. 250-345.000.

Stewart, Edwin D.: *See—*
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Steyr-Daimler-Puch Aktiengesellschaft: *See—*
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Stipcevich, John M. Power transmission substation arrangement. 3,887,821, Cl. 307-112.000.

Stockhaus, Klaus: *See—*
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Stoepel, Kurt: *See—*
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Stone, Edward; Zamer, Joseph; Guagliardo, Matthew; and Wieland, Kenneth F., to Inmont Corporation. Laminates having a polyurethane adhesive. 3,887,757, Cl. 428-425.000.

Stork Amsterdam N.V.: *See—*
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Stotlar, Suzanne C., to Kewanee Oil Company. Transmitting power meter for measurement of radiation. 3,887,471, Cl. 250-338.000.

Stott, Reginald W. Glass washing machine. 3,886,959, Cl. 134-134.000.

Straarup, Orla; and Helmich, Paul Otto Gunther, to Aktieselskabet Nro Atomizer. Atomizer wheel for the atomization of slurries. 3,887,133, Cl. 239-224.000.

Strange, John, to Firth Cleveland Fastenings Ltd. Self-threading nut. 3,886,989, Cl. 151-7.000.

Strehlke, Gunter; Franz, Wilhelm; and Osterburg, Gunter, to Deutsche Texaco Aktiengesellschaft. Process for the production of higher alkylacrylates and methacrylates. 3,887,609, Cl. 260-486.00R.

Streight, William Edward: *See—*
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Stromstedt, Sven Sixten; and Bystrom, Sven Borje, to Kraftwerk Union Aktiengesellschaft; and Mannesmannrohren-Werke Aktiengesellschaft. Method and means for shot peening of tubes. 3,886,774, Cl. 72-53.000.

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Stubbs, Shirley Bowers: *See—*
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Stubstad, James A.: *See—*
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Stultz, Robert George: *See—*
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Stumpf, Joseph G.; and Andera, Joseph F., to Frigitronics of Conn., Inc. Cryosurgical apparatus. 3,886,945, Cl. 128-303.100.

Sturhahn, Hans, to Feldmuhle Anlagen- und Produktions- Gesellschaft mit beschrankter Haftung. Shaped zirconium oxide bodies of high strength. 3,887,387, Cl. 106-57.000.

Styhr, Karsten H.; Ezis, Andre; and Goodyear, Michael U., to Ford Motor Company. Method of making a triple density silicon nitride article. 3,887,412, Cl. 156-89.000.

Styhr, Karsten H.: *See—*
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Sucro, Jost S.; and Benasutti, Louis D., to General Motors Corporation. Ice dispensing device with oscillating ram. 3,887,119, Cl. 222-247.000.

Sudoh, Kengo: *See—*
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Suessmilch, Klaus, to Fritz Schwarzer GmbH. Overcurrent protective circuit. 3,886,932, Cl. 128-2.10R.

Sugii, Takeo: *See—*
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Sugimoto, Yoshihiko: *See—*
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Sugio, Akitoshi: *See—*
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Yonemitsu, Eiichi; Sugio, Akitoshi; Kamiyama, Seiichi; Masu, Masanobu; and Kimura, Masaharu, 3,887,647.

Sugiyama, Hiroshi; Hirota, Toshio; Kakei, Jun; and Kabasawa, Yoshiji, to Nissan Motor Company Limited. Hybrid power system. 3,886,810, Cl. 74-751.000.

Sukhanov, Alexandr Alexandrovich: *See—*
Vernik, Alexandr Borisovich; Listkov, Viktor Fedorovich; Skorupsky, Boris Pavlovich; Grinshpun, Mark Izrailevich; Tetelbaum, Petr Iosifovich; Tyrtov, Anatoly Sergeevich; Konyaev, Vladimir Petrovich; Afanasiev, Ivan Petrovich; Kazakevich, Igor Illarionovich; Kalinushkin, Pavel Nikitovich; Andreev, Ivan Ivanovich; and Sukhanov, Alexandr Alexandrovich, 3,886,651.

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Sun Ventures, Inc.: *See—*
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Sundqvist, Hans Edvin; and Andersson, Karl Erik Gustav, to AB Motala Verkstad. Method in the destruction of waste by gasification and combustion. 3,886,873, Cl. 110-8.00R.

Sundqvist, Yngve Bertil, to SKF Industrial Trading and Development Company B.V. Pressure medium operated frictionless seal assembly. 3,887,199, Cl. 277-74.000.

Sunstrand Corporation: *See—*
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Suokko, George D.: *See—*
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Susuki, Rinnosuke; Hoshi, Hiroshi; Yoshida, Minoru; Toyoda, Toshisaburo; Nakamura, Masayoshi; and Ando, Susumu, to Raion Yush Kabushiki Kaisha. Detergent composed of hollow spherical pellets, and process for manufacturing the same. 3,887,614, Cl. 252-521.000.

Sutter, Hanspeter, to Luwa AG. Method of and apparatus for automatic cleaning of an air filter. 3,887,341, Cl. 55-96.000.

Sutton, Blaine M.; Walz, Donald T.; and Weinstock, Joseph, to Smith-Kline Corporation. Anti-arthritic compositions comprising an S-phosphine or phosphite gold thio-cyanate and methods of producing anti-arthritic activity. 3,887,707, Cl. 424-210.000.

Suzuki, Masaru: *See—*
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Suzuki, Seiichi, to Todo Seisakusho Ltd. Power-operated vehicle. 3,887,095, Cl. 214-130.00R.

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Swedenberg, Clyde J.; Fain, Charles C.; and Rutledge, William W. Method and composition for applying a covering to a wall or like substrate. 3,887,748, Cl. 428-247.000.

Sweeney, William A.; and House, Ralph, to Chevron Research Company. Process for converting alkyl sultones to alkene sulfonic acids. 3,887,611, Cl. 260-513.00R.

Swigert, David L., to Environmental Metrology Corp. Toxic gas indicator. 3,887,908, Cl. 340-237.00R.

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Szabo, Anthony W.; and Del Guercio, Louis R. M., to Scala, Anthony, a part interest. Power operated fluid infusion device. 3,886,938, Cl. 128-218.00A.

Szmuszkovicz, Jacob: *See—*
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Taft, David D.; and Shepler, Terry H., to Ashland Oil, Inc. Carpet backsized with hot melt adhesive and method. 3,887,738, Cl. 428-95.000.

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Tajnafoi, Jozsef; Gellert, Karoly; Hidasi, Karoly; Gribovszki; and Vekony, Sandor, to Nehezipari Muszaki Egyetem. Grinding machine for machining polygonal workpieces. 3,886,693, Cl. 51-105.0EC.

Takagi, Toshiaki, to Yoshiaki Takagi. Method for making slideless fastener. 3,887,675, Cl. 264-156.000.

Takahashi, Akira; Kojima, Hiroo; Ogawa, Masao; Osuka, Hiroshi; and Kobayashi, Shoichi, to Showa Denko Kabushiki Kaisha. Method of producing polymer compositions based on chlorinated polyethylene. 3,887,648, Cl. 260-878.00R.

Takahashi, Koichi; and Abe, Eiichi, to Nissan Motor Company Limited. Motor vehicle drive lines. 3,887,024, Cl. 180-70.00P.

Takahashi, Susumu, to Sansui Electric Co., Ltd. Decoder apparatus adapted for different 4-channel matrix systems. 3,887,770, Cl. 179-1.0GQ.

Takamizawa, Minoru: *See—*
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Takase, Kazuei; and Morikawa, Junji, to Eiken Chemical Co., Ltd. Method of determining unsaturated iron binding capacity in serum. 3,887,332, Cl. 23-230.00B.

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Takeuchi, Shigeo. Apparatus for applying wax to the side surfaces of vehicles. 3,886,893, Cl. 118-2.000.

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Takubo, Hachiroh; Sudoh, Kengo; and Kerman, Stephen, to Nippon Tsu Shin Kogyo K.K.; and TIE/Communications, Inc. Transistor switching circuit for use in a telephone system. 3,887,774, Cl. 179-99.000.

Talbot, John M. Automatic header height control system for combines and the like. 3,886,718, Cl. 56-208.000.

Tamai, Shigetake. Gas-atomizing nozzle by spirally rotating gas stream. 3,887,135, Cl. 239-406.000.

Tamura, Nobuhiro: *See—*
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Tanaka, Ichiro. Method for mechanically cutting flanges from preshaped steel construction members. 3,886,825, Cl. 83-13.000.

Tang, Arthur Y. C., to General Diode Corporation. Material treatment method. 3,887,392, Cl. 134-1.000.

Tantlinger, Keith W., to Rohr Industries Inc. Thrust responsive pinch wheel drive mechanism. 3,886,869, Cl. 104-147.00R.

Tao, Eddie Vi Ping, to Eli Lilly and Company. Preparation of 2-amino-5-alkyl-1,3,4-thiadiazoles. 3,887,572, Cl. 260-306.80D.

Taplin, Lael B., to Bendix Corporation, The. Passive adaptive engine control system for improved vehicle driveability. 3,886,915, Cl. 123-102.000.

Tarkan, Stuart E.: *See—*
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Taylor, Charles F., to Borg-Warner Corporation. Shaft connecting apparatus. 3,887,290, Cl. 403-370.000.

Taylor, Harold M.; Davenport, James D.; and Hackler, Ronald E., to Eli Lilly and Company. Alpha, alpha-disubstituted-5-pyrimidinemethanes used as fungicides. 3,887,708, Cl. 424-251.000.

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Tedeschi, Piero: *See—*
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Thomas, Walter W. Retractable step for vehicles. 3,887,217, Cl. 280-166.000.

Thomaswick, Ronald J., to PPG Industries, Inc. Article transporting rack. 3,887,071, Cl. 206-454.000.

Thompson, Charles H.; and Jones, Fred W., to United States of America, Energy Research and Development Administration. Apparatus for measuring tool path accuracy. 3,886,666, Cl. 33-174.00P.

Thompson, David A.: *See—*
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Thompson, Earl Clayton. Watering valve for animals. 3,887,165, Cl. 251-339.000.

Thompson, Herbert Lytle, to Universal Oil Products Company. Liquid interface level determining system. 3,886,795, Cl. 73-299.000.

Thompson, William S., III, to Texas Instruments Incorporated. High resolution wide field scan system. 3,887,263, Cl. 350-7.000.

Thornburg, Russell B.; and Jones, Klemme M., to Global Marine Inc. Mooring apparatus for ice-breaking drill ship. 3,886,882, Cl. 114-40.000.

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Tokunaga, Takeshi; Maekawa, Toshiaki; Uno, Takeshi; Akagi, Tadashi; Abe, Nobuyuki; Kume, Takeo; Ohnishi, Yukio; and Shimomura, Yasumi, to Nippon Concrete Kogyo Kabushiki Kaisha. Automatic fastening device with bolts for concrete molds. 3,886,821, Cl. 81-54.000.

Tokyo Shibaura Electric Co., Ltd.: *See—*
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Turzillo, Lee A. Method of extending augered pile cavity through rock or like obstruction. 3,886,754, Cl. 61-53.640.

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Ueta, Seiki; and Ivo, Osmar Chaves, to Petroleo Brasileiro S.A. -Petrobras. Process for obtaining oil, gas and byproducts from pyrobituminous shale or other solid materials impregnated with hydrocarbons. 3,887,453, Cl. 208-11.000.

Uhlig, Klaus, to Brown Boveri-Sulzer Turbomaschinen Aktiengesellschaft. Shutoff apparatus. 3,886,964, Cl. 137-340.000.

Ukkestad, Donald C.; Hancock, Donald C.; and Valiquette, Donley J., to Spacelabs, Inc. Defibrillator. 3,886,950, Cl. 128-419.00D.

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Ulvild, George B. Liquid cleansing composition and method of producing. 3,887,497, Cl. 252-526.000.

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Appel, Arthur, and A. J. Stein. Process for the interactive design of polyhedra. T935,004, 6–3–75, Cl. 444—1.

Baker, Melvin C. Method for treating polyglycol-water emulsions to remove solids. T935,006, 6–3–75, Cl. 210—45.

Bennett, Brian T., and A. C. McKellar. Process for the sequential recovery of the records of a file. T935,005, 6–3–75, Cl. 340—172.5.

Chapman, Aurelius F. Soft adhesive for two-adhesive polyester bags. T935,001, 6–3–75, Cl. 229—53.

Linville, Thomas P., E. Schischa, and G. R. Thompson. Process for selecting circuits with optimum power and area requirements. T935,003, 6–3–75, Cl. 444—1.

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Bennett, Brian T., and McKellar. T935,005.

Schischa, Erwin: *See*—
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Seliber, Joseph. Liquefied natural gas oxygen separation water desalination and electrical generation system. T935,002, 6–3–75, Cl. 203—10.

Stein, Arthur J.: *See*—
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Mitteiman, Alan J., and W. H. Phillips. Vehicle bumper panel. 235,250, 6–3–75, Cl. D12—169.

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Bennett, David. 235,248.

Morgan, Donald F.: *See*—
May, Joseph R., and Morgan. 235,252.
May, Joseph R., and Morgan. 235,253.

Murphy, James V. Panel board for integrated circuit packages. 235,264, 6–3–75, Cl. D26—1.

Murray, James W.: *See*—
Evans, David E., Jr., and Murray. 235,246.

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Seymour, Merritt W. 235,262.

Oxford Pendaflex Corp.: *See*—
Perry, Gordon. 235,257.

Pecenka, Josef. Hammerhead. 235,243, 6–3–75, Cl. D8—79.

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Braginetz, Paul A. 235,247.

Phillips, Wilbert H.: *See*—
Mittelman, Alan J., and Phillips. 235,250.

Prizlow, Alfred J. to GF Business Equipment, Inc. Chair. 235,233. 6–3–75, Cl. D6—30.

Prizlow, Alfred J., to GF Business Equipment, Inc. Chair. 235,236, 6–3–75, Cl. D6—66.

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Schuman, Seymour, and Kelson. 235,279.

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Wichman, William J., and Hart. 235,261.

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Stoppacher, Waldermar, to Interoptic Laboratories, Inc. Abrasive pad for grinding lenses. 235,244, 6–3–75, Cl. D8—90.

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Uridge, Laurence T.: *See*—
Dart, William A., and Uridge. 235,242.

Welle, Glen R. Fish lure. 235,259, 6–3–75, Cl. D22—27.

Wichman, William J., and D. L. Hart, to Rain Bird Sprinkler Mfg. Corp. Color coded nozzle. 235,261, 6–3–75, Cl. D23—34.

Worley, Lauren D.: *See*—
Lundblade, Eugene D., Madison, Thornton, Baugh, and Worley. 235,281.

CLASS 2
9 3,
206 3,
237 3,
CLASS 3
1 3,
3,
3,
CLASS 4
172 3,
255 3,
CLASS 5
8 3,
81R 3,
3,
82 3,
104 3,
108 3,
110 3,
CLASS 8
171 3,
CLASS 9
7 3,
14 3,
CLASS 14
3,
71 3,
3,
CLASS 15
1.7 3,
169 3,
172 3,
187 3,
217 3,
230.11 3,
230.13 3,
319 3,
340 3,
CLASS 16
112 3,
163 3,
184 3,
CLASS 17
11 3,
76 3,
CLASS 19
156.3 3,
CLASS 21
2.5R 3,
CLASS 23
230EP 3,
230B 3,
230R 3,
232E 3,
254E 3,
277C 3,
284 3,
CLASS 24
16PB 3,
134N 3,
167 3,
201C 3,
205.13R 3,
CLASS 28
72.11 3,
CLASS 29
156.4WL 3,
157.1R 3,
157.3A 3,
191.6 3,
200P 3,
203DT 3,
203MW 3,
243.57 3,
270 3,
434 3,
452 3,
568 3,
596 3,
624 3,
CLASS 30
90.3 3,
164.9 3,
294 3,

CLASSIFICATION OF PATENTS

ISSUED JUNE 3, 1975

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2
9 3,886,596
206 3,886,597
237 3,886,598

CLASS 3
1 3,886,599
3,886,600
3,886,601

CLASS 4
172 3,886,602
255 3,886,603

CLASS 5
8 3,886,604
81R 3,886,605
3,886,610
82 3,886,606
104 3,886,607
108 3,886,608
110 3,886,609

CLASS 8
171 3,887,329

CLASS 9
7 3,886,611
14 3,886,612

CLASS 14
3,886,613
71 3,886,614
3,886,615

CLASS 15
1.7 3,886,616
169 3,886,617
172 3,886,618
187 3,886,619
217 3,886,620
230.11 3,886,621
230.13 3,886,622
319 3,886,623
340 3,886,624

CLASS 16
112 3,886,625
163 3,886,627
184 3,886,626

CLASS 17
11 3,886,635
76 3,886,628

CLASS 19
156.3 3,886,629

CLASS 21
2.5R 3,887,330

CLASS 23
230EP 3,887,331
230B 3,887,332
230R 3,887,333
232E 3,887,334
254E 3,887,335
277C 3,887,336
284 3,887,337

CLASS 24
16PB 3,886,630
134N 3,886,631
167 3,886,632
201C 3,886,633
205.13R 3,886,634

CLASS 28
72.11 3,886,636

CLASS 29
156.4WL 3,886,637
157.1R 3,886,638
157.3A 3,886,639
191.6 3,887,338
200P 3,886,640
203DT 3,886,642
203MW 3,886,641
243.57 3,886,643
270 3,886,644
434 3,886,645
452 3,886,648
568 3,886,652
596 3,886,653
624 3,886,654

CLASS 30
90.3 3,886,655
164.9 3,886,656
294 3,886,657
388 3,886,658

CLASS 32
2 3,886,659
22 3,886,660
71 3,886,661

CLASS 33
18R 3,886,662
23D 3,886,663
27C 3,886,664
174P 3,886,666
174R 3,886,665
233 3,886,667

CLASS 34
9 3,886,668
107 3,886,669

CLASS 35
9A 3,886,670
35C 3,886,671
48R 3,886,672

CLASS 36
2.5AL 3,886,673
38 3,886,674

CLASS 37
25 3,886,675

CLASS 40
125F 3,886,676
152 3,886,677

CLASS 43
1 3,886,678
55 3,886,679

CLASS 46
39 3,886,680
77 3,886,681
202 3,886,682

CLASS 47
9 3,886,683

CLASS 49
44 3,886,684
209 3,886,685
488 3,886,686
503 3,886,687
504 3,886,688

CLASS 51
43 3,886,689
80A 3,886,690
101LG 3,886,691
3,886,692
105EC 3,886,693
170PT 3,886,694
216LP 3,886,695
283 3,886,696
317 3,886,697

CLASS 52
36 3,886,698
90 3,886,699
108 3,886,700
200 3,886,701
221 3,886,702
460 3,886,709
473 3,886,703
530 3,886,704
586 3,886,705
615 3,886,706
758F 3,886,707
758H 3,886,710

CLASS 53
14 3,886,711
21FW 3,886,712
24 3,886,713
180 3,886,714
329 3,886,708
384 3,886,715

CLASS 55
66 3,887,339
72 3,887,340
96 3,887,341
203 3,887,342
262 3,887,343
294 3,887,344
386 3,887,345

CLASS 56
17.4 3,886,716
201 3,886,717
208 3,886,718
344 3,886,719

CLASS 57
13 3,886,720
156 3,886,721
157TS 3,886,722

CLASS 58
21.15 3,886,723
23BA 3,886,724
50R 3,886,725
3,886,726

CLASS 59
79B 3,886,727

CLASS 60
39.23 3,886,728
39.24 3,886,729
39.28R 3,886,730
39.28T 3,886,731
39.35 3,886,732
39.48 3,886,733
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39.74R 3,886,736
226R 3,886,737
277 3,886,738
286 3,886,739
341 3,886,740
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521 3,886,743
3,886,744
533 3,886,745
547 3,886,746
585 3,886,747
651 3,886,748
652 3,886,749

CLASS 61
1F 3,886,750
3 3,886,751
45R 3,886,752
46.5 3,886,753
53.64 3,886,754
72.6 3,886,755

CLASS 62
4 3,887,346
13 3,886,756
20 3,886,757
30 3,886,758
54 3,886,759
114 3,886,760
217 3,886,761
380 3,886,762
402 3,886,763
3,886,764
3,886,765

CLASS 64
17R 3,886,766

CLASS 65
3 3,887,347
30 3,887,348
161 3,887,349
267 3,887,350
305 3,887,351

CLASS 66
9B 3,886,767
195 3,886,768

CLASS 68
15 3,886,769

CLASS 70
18 3,886,770
90 3,886,771
456R 3,886,772
457 3,886,773

CLASS 71
67 3,887,352
3,887,353
90 3,887,354
93 3,887,355
3,887,356
95 3,887,357
104 3,887,358

CLASS 72
53 3,886,774
60 3,886,775
71 3,886,776
84 3,886,777
180 3,886,778
181 3,886,779
324 3,886,780
344 3,886,781
391 3,886,782
3,886,783

CLASS 73
17A 3,886,784
23 3,886,785
27R 3,886,786
59 3,886,789
88.5R 3,886,787
117 3,886,788
117.4 3,886,790
150R 3,886,791
151 Re.28,436
167 3,886,792
3,886,793
194B 3,886,794
299 3,886,795
328 3,886,796
335 3,886,797
343R 3,886,798
398AR 3,886,799
421.5R 3,886,800
432R 3,886,801

CLASS 74
3.5 3,886,802
5.6D 3,886,803
18.2 3,886,804
52 3,886,805
491 3,886,806
521 3,886,807
569 3,886,808
681 3,886,809
710.5 3,886,813
730 3,886,814
745 3,886,815
750B 3,886,811
751 3,886,810
764 3,886,816
813L 3,886,812
861 3,886,817
866 3,886,818
868 3,886,819
869 3,886,820

CLASS 75
11 3,887,359
46 3,887,360
108 3,887,361
123K 3,887,362
171 3,887,363
174 3,887,364
214 3,887,365

CLASS 81
52.4R 3,886,822
54 3,886,821
175 3,886,823

CLASS 82
47 3,886,824

CLASS 83
13 3,886,825
3,886,826
56 3,886,827
150 3,886,828
198 3,886,829
285 3,886,830
294 3,886,831
308 3,886,832
499 3,886,833

CLASS 84
1.17 3,886,834
1.24 3,886,835
1.26 3,886,836
388 3,886,837
470 3,886,838
484 3,886,839

CLASS 85
62 3,886,840

CLASS 89
1B 3,886,842
1F 3,886,841
136 3,886,843
191A 3,886,844

CLASS 90
1.6 3,886,845
11C 3,886,846
13.8 3,886,847

CLASS 91
412 3,886,848

CLASS 92
168 3,886,849

CLASS 93
35SB 3,886,850

CLASS 96
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1R 3,887,367
1.5 3,887,368
3,887,369
29D 3,887,370
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36.1 3,887,371
48R 3,887,372
3,887,374
66R 3,887,376
66.5 3,887,375
87A 3,887,377
114.1 3,887,378
115R 3,887,379
126 3,887,380
127 3,887,381

CLASS 98
36 3,886,851
60 3,886,852
71 3,886,853
115K 3,886,854

CLASS 99
323.11 3,886,855
443C 3,886,856
563 3,886,857
643 3,886,858

CLASS 100
53 3,886,859

CLASS 101
4 3,886,860
109 3,886,862
119 3,886,861
125 3,886,863
126 3,886,864
456 3,886,865

CLASS 102
70.2R 3,886,866
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79 3,886,868

CLASS 104
147R 3,886,869

CLASS 105
61.5 3,886,870
157R 3,886,871

CLASS 106
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38.8 3,887,382
57 3,887,384
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96 3,887,385
99 3,887,386
100 3,887,388
212 3,887,389
271 3,887,390

CLASS 110
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8R 3,886,873

CLASS 111
7.4 3,886,874
85 3,886,875

CLASS 112
27 3,886,876
121.15 3,886,877
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CLASS 113
121C 3,886,881

CLASS 114
40 3,886,882
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66.5H 3,886,884
74A 3,886,885
125 3,886,886
230 3,886,887
235WS 3,886,888

CLASS 115
.5R 3,886,889

CLASS 116
124.3 3,886,890

CLASS 118
1 3,886,891
2 3,886,892
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7 3,886,895
49.1 3,886,896
309 3,886,897
411 3,886,898
504 3,886,899
637 3,886,900

CLASS 119
1 3,886,901
3 3,886,902
3,886,903
3,886,904
3,886,905

CLASS 122
32 3,886,906

CLASS 123
8.13 3,886,907
8.31 3,886,908
8.45 3,886,909
3,886,910
3,886,911
8.47 3,886,912
44D 3,886,913
73AD 3,886,914
102 3,886,915
117R 3,886,916
119F 3,886,917
122AC 3,886,918
133 3,886,919
136 3,886,920
139E 3,886,921
140R 3,886,922
148DC 3,886,923

CLASS 124
23R 3,886,924

CLASS 125
15 3,886,925
21 3,886,926
23C 3,886,927

CLASS 127
46A 3,887,391

CLASS 128
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2F 3,886,928
3,886,930
2.1R 3,886,931
3,886,932
7 3,886,933
24.1 3,886,934
57 3,886,935
66 3,886,936
214R 3,886,937
218A 3,886,938
268 3,886,939
271 3,886,940
287 3,886,941
290 3,886,942
303.1 3,886,944
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305 3,886,943
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348 3,886,947
350V 3,886,948
360 3,886,949
419D 3,886,950

CLASS 130
30R 3,886,951

CLASS 131
70 3,886,952
170A 3,886,953
175 3,886,954
261R 3,886,955

CLASS 132
91 3,886,956

CLASS 133
1A 3,886,957

CLASS 134
1 3,887,392
80 3,886,958
134 3,886,959
138 3,886,960

CLASS 135
1R 3,886,961
49 3,886,962

CLASS 136
6LN 3,887,397
6L 3,887,396
26 3,887,398
86A 3,887,399
3,887,400
173 3,887,393
3,887,394

CLASS 137
334 3,886,963
340 3,886,964
355.16 3,886,965
493.2 3,886,966
495 3,886,967
501 3,886,968
509 3,886,969
561R 3,886,970
599 3,886,971
602 3,886,972
604 3,886,973
613 3,886,974
625.42 3,886,975

CLASS 138
38 3,886,976
89 3,886,977
103 3,886,978
118.1 3,886,979
127 3,886,980
149 3,886,981

CLASS 141
39 3,886,982
68 3,886,983

CLASS 144
3D 3,886,984
309AC 3,886,985

CLASS 148
31.57 3,887,395
121 3,887,401
126 3,887,402

CLASS 150
52J 3,886,986
52R 3,886,988
52 3,886,987

CLASS 151
7 3,886,989

CLASS 156
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42 3,887,406
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89 3,887,411
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108 3,887,414
154 3,887,415
156 3,887,416
181 3,887,417
197 3,887,418
3,887,419
235 3,887,420
280 3,887,421
334 3,887,422
402 3,887,423
435 3,887,424

CLASS 159
48L 3,887,425

CLASS 160
374.1 3,886,990

CLASS 162
29 3,887,426
158 3,887,427
216 3,887,428
261 3,887,429

CLASS 164
4 3,886,991
56 3,886,992
211 3,886,993
250 3,886,994
260 3,886,995
283M 3,886,996

CLASS 165
1 3,886,997
2 3,886,998
26 3,887,000
81 3,887,001
113 3,887,002
142 3,887,003
179 3,887,004

CLASS 166
72 3,887,005
124 3,887,006
224A 3,887,007
267 3,887,008
292 3,887,009
314 3,887,010

CLASS 169
69 3,887,011

CLASS 172
4.5 3,887,012
20 3,887,013
54 3,887,014
254 3,887,015
311 3,887,016

CLASS 173
46 3,887,017
120 3,887,018
134 3,887,019
159 3,886,999

CLASS 174
15R 3,887,759
68.5 3,887,760
110R 3,887,761

CLASS 175
206 3,887,020
422 3,887,021

CLASS 177
146 3,887,022

CLASS 178
6 3,887,762
3,887,763
6.8 3,887,764
7.6 3,887,765
7.82 3,887,766
18 3,887,767
67 3,887,768
69.5R 3,887,769

CLASS 179
1GQ 3,887,770
1C 3,887,771
1.5M 3,887,772
6R 3,887,773
99 3,887,774
175.3R 3,887,775

CLASS 180
5R 3,887,023
70P 3,887,024
73TL 3,887,025
79.2R 3,887,028
79.2 3,887,026
3,887,027
114 3,887,029
121 3,887,030

CLASS 181
33G 3,887,031
59 3,887,032

CLASS 182
78 3,887,033
129 3,887,034
186 3,887,035

CLASS 184
6.12 3,887,037
6.16 3,887,036

CLASS 187
27 3,887,038
29R 3,887,039

CLASS 188
1A 3,887,040
71.5 3,887,041
71.8 3,887,042
73.1 3,887,043
73.3 3,887,045
73.5 3,887,044
181A 3,887,046
196R 3,887,047

CLASS 191
1A 3,887,776

CLASS 192
3.28 3,887,048
4A 3,887,049
4R 3,887,050
85AA 3,887,051
127 3,887,052

CLASS 193
34 3,887,053

CLASS 194
92 3,887,054

CLASS 195
1.7 3,887,430
5 3,887,431
36P 3,887,432
65 3,887,434
81 3,887,433
82 3,887,435
142 3,887,436

CLASS 197
135R 3,887,055
168 3,887,056
186B 3,887,057
192 3,887,058

CLASS 198
20C 3,887,059
30 3,887,060
34 Re.28,437
36 3,887,061
52 3,887,062
165 3,887,063
219 3,887,064
280 3,887,065
285 3,887,066

CLASS 200
19DR 3,887,780
61.69 3,887,777
144B 3,887,778
153L 3,887,779

CLASS 202
117 3,887,437
262 3,887,438

CLASS 203
63 3,887,439

CLASS 204
13 3,887,440
39 3,887,443
43S 3,887,444
55R 3,887,445
59QM 3,887,441
72 3,887,442
86 3,887,446
129.4 3,887,447
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148 3,887,449
159.15 3,887,450
192 3,887,451
211 3,887,452

CLASS 206
45.14 3,887,067
223 3,887,068
229 3,887,069
392 3,887,070
454 3,887,071
455 Re.28,438
484 3,887,072
507 3,887,073

CLASS 208
11 3,887,453
111 3,887,454
112 3,887,455

CLASS 209
158 3,887,074
211 3,887,456
214 3,887,457
219 3,887,458

CLASS 210
8 3,887,459
37 3,887,460
39 3,887,461
53 3,887,462
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117 3,887,464
130 3,887,465
131 3,887,466
186 3,887,467
206 3,887,468
223 3,887,469
261 3,887,470

CLASS 211
5 3,887,075
10 3,887,076
45 3,887,077
50 3,887,078
118 3,887,079

CLASS 212
11 3,887,080
128 3,887,081

CLASS 214
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3,887,084
1H 3,887,083
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6DK 3,887,087
6C 3,887,088
16.1B 3,887,089
17C 3,887,090
38R 3,887,091
75T 3,887,092
84 3,887,093
89 3,887,094
130R 3,887,095
145 3,887,096
730 3,887,097
762 3,887,098

CLASS 215
220 3,887,099
256 3,887,100

CLASS 219
10.49 3,887,781
69V 3,887,782
85 3,887,783
121EM 3,887,784
209 3,887,785
214 3,887,786
216 3,887,787
219 3,887,788
265 3,887,789
535 3,887,790

CLASS 220
4F 3,887,101
8 3,887,102
20 3,887,103
85B 3,887,104
277 3,887,105

CLASS 221
197 3,887,106
241 3,887,107

CLASS 222
1 3,887,108
3 3,887,109
16 3,887,110
57 3,887,111
85 3,887,112
146HE 3,887,113
176 3,887,114
247 3,887,119
402.13 3,887,115
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6 : 3,725	18 : Re.28,435				

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

10 : T935,001	17 : T935,002	36 : T935,003	T935,004	T935,005	T935,006

DESIGN PATENTS

6	:	235,234	20	:	235,239		235,272	235,241		235,267	41 : 235,276
		235,250			235,281		235,278	235,244		235,269	44 : 235,264
		235,251	22	:	235,235	29	: 235,245	235,248		235,274	45 : 235,282
		235,256	26	:	235,233		235,270	235,255		235,279	48 : 235,273
		235,261			235,236	34	: 235,252	235,257	37	: 235,277	51 : 235,247
9	:	235,268			235,237		235,253	235,260	39	: 235,246	235,280
16	:	235,254			235,242		235,265	235,266		235,262	55 : 235,275
18	:	235,240	27	:	235,259	36	: 235,238				

U. S. GOVERNMENT PRINTING OFFICE : O - 1975

U.S. DEPARTMENT OF COMMERCE
Rogers C. B. Morton, *Secretary*

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, *Commissioner*